The Competitiveness of UK Vehicle Component Manufacturers

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Confidentiality

Section 5, some associated appendicies and Section 6, in the original version of this thesis passed by examiners in January 1986, contained some confidential information. In this public version, this confidential information is omitted and the symbol <> is used to indicate wherever this occurs. The effect is fairly small and does little to damage the integrity or the flow of the original text.

It must be stressed that, although my field research has involved many companies referred to, the views expessed are my own. My interpretation of events will not always be the same as those of every company participating in the study. Finally, the field research discussed in detail in Section 5 was completed in 1983. This section attempts to examine events only up to that time. Desk research covering more recent events has allowed for some subsequent updating, but the situation of many companies visited and discussed in Section 5 will now have changed.

Summary

This dissertation presents the results of using a multidisciplinary "business policy" approach to examine the competitive situation of UK vehicle component manufacturers. With the cooperation of the companies involved in six product sectors, detailed studies have been made comparing the strategies and performances of UK competitors over several years, as well as those of selected competitors in Japan, Germany and the USA.

The UK vehicle component industry has undergone an unprecedented decline in performance.

The causes of this decline are many. External factors outside the control of the companies concerned include the declining competitiveness of UK based vehicle manufacturers and the exceptionally unfavourable UK business environment including the pressure on real wages.

But the decline in competitiveness of UK vehicle component manufacturers is not solely due to these factors outside their own control. Just as important is the lack of strategic management capability at the top management level of the companies themselves. Before the recession many of the companies failed to see the changes that were occurring in the pattern of competition and that their competitive position was slipping. Few recognised that competition was becoming more European or even more global. Even fewer were able to effectively analyse the situation, select a viable long term strategy and pursue it with commitment. Such a strategy required a choice of the part of the market in which to compete as well as how to compete particularly as far as longer term production strategy (productivity, quality, flexible manufacturing systems etc) was concerned.

The recession only added to this problem and obscured the underlying cause. Many companies were forced to retrench but still have not recognised the longer term strategic issues which must be addressed if the long term decline is to be reversed.

1. Introduction

The roots of this study date back twelve years, to a decision on completion of my final economics examinations at Cambridge to continue my professional training as an engineer and to return to industry. Having worked in industry, studying economics kindled an interest in the issue of why British industry seemed to be failing to compete, and more importantly in what could be done about it. Yet once kindled this interest was scarcely quenched by studying economics.

Indeed the sheer generality of many theoretical approaches often seemed to preclude sufficient attention to many specific issues arising out of the unique contextual circumstances of British production. There were of course many instances of more practical approaches, such as my tutor C F Pratten's work in the field of international productivity comparisons, but somehow what was regarded as mainstream economics appeared to have sidestepped the issue of industrial competitiveness, an issue seemingly so central to Britain's needs: it was as if some impasse had been reached.

Whilst continuing to develop my academic interests, I therefore determined to make use of my early training by returning to industry as an engineer so as to see the problem from a participant's viewpoint. My early training, much of it supervised by Cambridge, involved visiting or working with about one hundred factories throughout the UK and elsewhere in Europe and permitted a broad perspective. For the next five years I continued to work with GKN. For

about half this time I was a development engineer on "product and process development" in the area of forgings (one of the cases discussed in this thesis); for the other half as a project engineer on international projects, including GKN's project to establish, in liaison with German operations, manufacturing facilities for constant velocity joints in the USA. Only then, when I had attained qualifications as a Chartered Mechanical Engineer, in management studies, and in ICMA professional accountancy examinations, did I feel properly equipped to begin this study, a study of Britain's competitiveness, focused onto an important sector where my past experience can be of most use.

Although focused, as any doctoral thesis must be, this is not however yet another narrow study, of interest only to those closely concerned. The sector chosen is quite deliberately complex and large enough to be economically significant in itself; whilst yet being amenable to an examination of the specific competitor companies and countries. The case approach adopted is envisaged as providing a bridge between those studies of Britain's competitiveness which because of their generality are necessarily over-aggregated, and many case studies which tend to be too narrow to link back to any more general picture.

Research findings are bound to be influenced by the disciplinary approach of the researcher. Thus it is natural for an economist looking at the problem of the UK's declining industrial competitiveness to seek in this phenomenon lessons for economic policy. Similarly a

marketing expert will seek lessons in terms of how British firms can improve their approaches to marketing. Indeed in reviewing contributions to this issue it is clear that every discipline (including those with engineering backgrounds such as my own) sees the issue primarily as one of its subject area. Methodologically such stances are particularly attractive, since in taking a single discipline approach it is possible to establish more rigorous tests of hypotheses. Yet from a policy perspective competitiveness is a multidimensional issue and a balanced multidisciplinary approach is essential, though this in practice precludes more quantitative methods.

The difference in perspective offered by this approach may be illustrated by a military analogy. Modern business competition is, in fact, very much like warfare. Doubtless, whether winning or losing, staff despatched to the front line would see highlighted lessons for particular fu· tions. It would be possible to write treatises on how logistics for example could be improved, of general interest to anyone interested in that subject. However a policy perspective attempts to take a commander's broad viewpoint. First, he wants some feel (through a balanced report with some quantitative back-up where appropriate) as to how the war is going. Are we winning or losing? How serious is the situation? Even establishing this may be no mean task. More importantly however, what are the key problems and therefore key requirements if the situation is to be improved? This is the perspective attempted here. Of course the commander may also wish to draw on those more

specialist staff functions which seem likely to be of critical significance, but that entails a different perspective.

Unlike war though, decisions affecting business competitiveness are not made by any single commander but reflect decisions and choices made by many parties. The competitive situation of the automotive components sector is affected by choices made by the wider community (including government) which can considerably affect the climate for business, decisions by UK vehicle assemblers, and decisions within the component companies themselves from top level "strategic decisions" right through to choices adopted on the shop floor by employees and labour unions. After studying the situation I have come to the view that each of these parties, in isolation, is quite helpless to deal with what appears to be a dangerous erosion of the country's competitiveness in this sector. Accordingly, this study simply attempts to describe the actual situation and underlying issues as accurately as possible. The target audience therefore is all these parties involved; it is hoped to contribute both to debate and ultimately to securing a more united response, without which it seems likely the UK will continue to decline.

Finally it has been most encouraging that the ESRC sponsored workshop involving many industrial participants, "SSRC Initiative on the Competitiveness and Regeneration of British Industry" (Russell Hotel, London, 17.10.83), appears to have endorsed many of the specifications drawn up for this research. This called for research focusing on business sectors exposed to international competition,

focused onto specific companies and specific competitor countries in particular Germany, Japan and the USA, and finally onto issues of particular concern to management. The emphasis in the business policy approach adopted is on how effective thinking on issues relating to business strategy can be improved.

Notes and Abbreviations

OE(M): original equipment (manufacturer(s))

AM: aftermarket

The main focus in this study has been on the OE situation, but a fairly broad perspective has been adopted recognising that OE and aftermarkets are highly interrelated. Similarly the term "vehicle" generally refers to cars, but suppliers were also encouraged to discuss the commercial vehicle situation where appropriate, and many anyway did not distinguish the two activities.

In just a few cases, company names have been disguised. Thus UKF1 refers to a UK forging company, JF1, USF1 and GF1 to Japanese, US and German forging companies respectively. Subsequent numbers, as in UKF2 for example, denote further forging companies of the same nationality. UKS1 similarly refers to a UK silencer company, but there are no other products for which this has been necessary.

2. Review of the Literature

2.1 Evidence of competitive decline

2.11 The historical situation

The issue of British competitiveness today is deeply rooted historically. By the middle of the nineteenth century, Britain's major business sectors were the most internationally competitive the world has ever known: "over 40% of the entire world output of traded manufactured goods [were] produced within the country" (Mathias, 1969). Even this figure grossly understates Britain's domination of higher value-added business sectors at that time. 85% of visible exports were in the form of finished goods, whereas 92% (by volume) of imports represented raw materials. Britain was producing approximately two thirds of the world's coal, half its iron, five sevenths of its steel, two thirds of its hardware and about half of commercial cotton cloth (Kennedy, 1981, p20).

The history of Britain's subsequent decline is well documented. As the rest of the world began to develop, such a lead was of course to prove unsustainable. As industrial development took off elsewhere, Britain's growth in industrial production slowed - from 4% p.a. during 1820 - 1840, to 3% p.a. during 1840 - 1870 and just over 1.5% p.a. during 1875 - 1894, far less than its chief rivals. In the newer more important industries, such as steel, chemicals, machine tools and electrical goods, Britain quite rapidly lost what early lead it possessed. Also it was pushed back out of European and North American markets as other

governments, with less vested interest (at that time) in free trade, developed their emerging industries behind protective tariff barriers.

German steel output, only half that of Britain in 1870, was twice its size by 1910. However, alarm over the competitive situation felt in this and many other industrial sectors was to have little impact on those formulating policy. Other business sectors, many closer to government, held opposite interests. Businesses in the service sector, particularly those in the City but also industries such as shipping and shipbuilding, held opposite interests because of their involvement in the expanding activities of overseas rivals. Kennedy (1981, p25) also argues that those involved in policy formulation "did not usually concern themselves in any intimate way with economic trends, and frequently manifested an aristocratic scorn for business men".

Indeed, as even countries well behind have since outpaced Britain, no adequate response to overseas competition appears to have been forthcoming at any point in Britain's subsequent history. Barclays Review (1983) neatly summarises the decline in Britain's trade performance from 1900 to the present day. Not only has Britain's share of world trade fallen, but import penetration has accelerated in recent years to the point where, for the first time this century, Britain is now running a deficit on trade in manufactured goods.

2.12 Britain's post-War international trade situation

Britain is highly dependent on international trade, most of this being trade in manufactured goooods. With the

rise of North Sea Oil, manufactured goods have fallen only slightly as a percentage of all exports, from 80% in 1955 to 75% in 1980. As a percentage of all imports, manufactured goods have risen sharply over the same period, from 23% to 64%.

Like other advanced countries', Britain's dependence on international trade has been growing. A number of writers have argued that the trade position in the important manufacturing sector has been allowed to deteriorate alarmingly, in that rising import penetration has rapidly outstripped the growth in exports, as shown in Table 1.

Table 1 Trade in manufactured goods 1955 - 1980

	1955	1965	1970	1975	1980
Imports/home demand %	8	11	15	22	30
Exports/mfrs' sales %	19	18	21	27	32

Source: Williams, Williams and Thomas (1983, pp138-9)

A number of forces of course influence an economy's overall trade balance, and will anyway tend to keep the total position in equilibrium in the long run. However, since the trade balance has been a problem constraining the economy in the past, such trends if allowed to continue could pose serious problems in the future, particularly after North Sea Oil ceases to make such a positive impact.

More significant is their evidence of a decline in Britain's share of world exports of manufactures, in comparison to performances of other advanced competitor countries, as shown in Table 2. This point is less subject to qualification from international trade arguments.

Table 2 Division of world manufacturing exports 1955 - 1980

% by country	1955	1965	1970	1975	1980
UK	20	14	11	9	10
Germany	15	19	20	20	20
France	9	9	9	10	10
Italy	3	7	7	7	8
USA	24	20	18	18	17
Japan	5	9	12	14	15

Source: Williams, Williams and Thomas (1983, pp116-7)

UK manufacturing has been losing ground to other major competitor countries, particularly Japan and mainland Europe. After 1970 Japan continued to move ahead, but these figures suggest the situation otherwise began to stabilise. Britain, inevitably, fell back somewhat from its very strong position in the aftermath of the War and this factor may explain the decline also in the US position. Yet the extent to which decline persisted is disturbing, and the reversal of the UK and West German positions suggests the problem was not merely one of an inability to sustain an unrealistically high share.

Concern over the issue of Britain's "deindustrialisation" has given rise to many recent contributions, for example Blackaby (1979). Although some have argued that manufacturing decline may be mitigated by the rise in services, Brown and Sheriff's paper showed that decline taking place in the main manufacturing business sectors did not merely reflect a switch to services, since as Table 3 indicates services have also displayed some decline in competitiveness, if slightly less sharp.

Table 3 Britain's share of trade in other sectors

	1955	1960	1965	1970	1975
Manufactured goods	20%	16%	14%	11%	9%
Invisibles	25%	21%	18%	16%	13%
Private services	26%	22%	17%	17%	16%

Source: Brown and Sheriff (in Blackaby, 1979)

Along with Singh (1977), Brown and Sheriff also argue that the UK economy is heavily dependent on manufacturing, since the net balance of payments contribution from services is relatively small.

2.13 Comparative output performance

I consider output levels and long term sustained growth in output as significant indicators of competitive performance. From a general economic point of view Britain's level of output per capita has been lower than many rival countries, especially the USA as is shown in Table 4.

Table 4 Per capita GDP ($)

Country	1967	1978
West Germany	2,030	10,347
United States	4,040	9,588
France	2,190	8,760
Japan	1,150	8,386
All OECD countries	2,290	7,683
United Kingdom	1,980	5,496

Exchange rate conversions - average rates for year given.

Source: Caves and Krause (1980)

Table 5 shows Britain's economic growth has been consistently lower than competitor countries, apart from the USA.

Table 5 Average annual growth rates of GDP (%)

Country	1957-67	1967-78	1967-73	1973-78
U.K.	3.1	2.3	3.4	1.1
U.S.A.	4.1	3.0	3.5	2.4
Japan	10.4	7.2	10.2	3.7
France	5.6	4.4	5.6	2.9
West Germany	5.5	3.8	5.3	2.0
OECD	4.8	3.8	4.8	2.5

Source: Caves and Krause (1980)

In consequence, Britain's share in world output has been gradually falling, but the decline of its share in manufacturing output has been particularly serious as indicated in Table 6.

Table 6 Britain's share of output 1960 - 1975

	1960	1966	1972	1975
UK share of world GDP	8.2%	7.6%	6.4%	6.4%
Share of OECD mfr output	9.6%	7.3%	5.9%	5.8%

Source: Brown and Sheriff (1978)

In recent years, as Table 7 demonstrates, Britain's manufacturing output has fallen even further behind.

Table 7 Manufacturing output growth 1970 - 1981

	1970	1973	1975	1979	1981
U.S.A.	100	122	109	144	142
Japan	100	128	109	145	160
EEC (exc UK)	100	115	108	128	125
of which:					
W. Germany	100	113	103	122	119
France	100	122	114	136	125
Italy	100	114	107	131	136
UK	100	111	102	106	91

Source: Begg and Rhodes (1982)

2.14 Profitability and investment

Sustained business growth depends upon profitability, which appears to have been lower in the case of UK manufacturing than for rival countries.

Table 8 Net rates of return in manufacturing

Averages per period	UK	USA	W Germany
1960-71	13%	30%	23%
1972-75	8%	21%	16%
1976-79	6%	22%	17%

Net return is defined as net operating surplus as % of net capital stock of fixed assets (excluding land).

Source: Begg and Rhodes (1982).

Given the UK's relatively high levels of inflation and its consequently high cost of finance, such levels of profitability seem unsatisfactory and may have contributed to the poor investment record indicated in Table 9.

Table 9 Investment per head in manufacturing (ECU)

UK	Belgium	Holland	Italy	France	W. Germany
72	86	96	64	106	155

Source: Begg and Rhodes (1982). Figures from Eurostat Review, 1970-79.

The broader issue of the UK's low economic growth has been widely discussed, for example Beckermann (1979), but there is recognition that competitive problems in the manufacturing sector are particularly sharp and merit detailed attention.

2.15 Industry sectors

Table 10 suggests competitive decline among major

manufacturing sectors has been widespread, but has been a particular problem in electrical engineering, vehicles, textiles, leather goods, clothing and footwear.

Table 10 Britain's trade performance by SIC

	Import Penetration*			Exports / Sales ratio*		
	1970	1975	1982	1970	1975	1982
Total manufacturing %	14	18	22	16	18	21
Chemicals	15	17	23	21	26	32
Metal manufacturers	16	20	25	13	14	20
Mechanical eng'	14	18	22	29	35	37
Instrument eng'	23	33	38	32	36	39
Electrical eng'	14	21	34	19	26	28
Vehicles	7	17	30	30	36	32
Metal goods	5	9	13	12	14	15
Textiles	12	19	31	17	19	22
Leather goods	16	21	35	20	19	23
Clothing and footwear	11	20	31	10	9	13
Shipbuilding & marine	34	47	15	19	21	16
Food, drink & tobacco	18	19	15	3	4	5
Timber & furniture	26	23	26	2	4	5
Paper, printing & publ'	18	19	20	6	7	9

Import penetration here defined as imports (c.i.f.) / home demand + exports

Export / sales here defined as exports (f.o.b.) / manuf' sales + exports

Source: Barclays Review, November 1983 (based on Business Monitors) and CSO Annual Abstracts

Literature giving more detailed attention to particular sectors often suggests even more serious decline than is revealed in such aggregated statistics: examples being motorcycles (Boston Consulting Group, 1975), shipbuilding (Williams, Williams and Thomas, 1983), portable power tools and typewriters (Prais, 1981), textiles (Toyne et al, 1984), telecommunications (NEDO, 1978), as well as cash registers, colour televisions and dishwashers.

Analysis directed at specific UK industry sectors, such as Boston Consulting Group (1975), seems to get closer to

the heart of Britain's problems of competitiveness. More recently, studies of global industry competition such as Toyne et al (1984) have increased in sophistication.

Any study of UK competitiveness must be sensitive to broader economic issues; but it seems both important and promising to extend analysis to important UK business sectors in a manner highlighting the competitive situation between the businesses which are actually in competition.

2.16 Clarification of the issue

Clarification of the issue of competitiveness requires some definition or concept which recognises the problem both at the economic level and also at the business level.

Competitiveness broadly refers to the ability of a business, group of businesses or indeed a country's economy as a whole, to sustain future growth. At the level of the firm, competitiveness may be defined by a business's sustainable growth rate relative to actual or likely competitors. This same definition can also be extended to a group of businesses such as a business sector in a given country, or indeed to the group of business sectors in a country comprising its economy, in which case the issue is one of economic growth relative to that of rival countries.

At all levels the concept of sustainability is important, because it is this that rules out superficial analysis and forces deeper examination of fundamental factors underlying the strength or weakness of a business's competitive position. It may not be difficult to obtain a temporary boost to performance: demand policy can stimulate

faster growth in the short term, an improvement in economic growth can stimulate the immediate prospects even of business sectors facing underlying competitive problems, and even a business in a weak position can stimulate its market share for a time; but the problem in all these cases reduces to sustainability. If the underlying competitive position is weak, a business will ultimately have to concede further growth as weaknesses show up in areas such as finance and, at a higher level, an economy will do the same as bottlenecks of one type or another begin to make themselves felt.

In the long term of course, the effect of competitiveness shows up in the growth of living standards (or real wage levels) that is sustainable, either for those working in a business or more generally in relation to the living standards available to people or workers in a given country. Again the key word is sustainable: it may not be difficult to obtain a temporary boost to living standards by pillaging the investment or ploughback on which competitiveness depends. This creates a paradox. Improved competitiveness should be reflected in improved living standards (or average wage levels); but improved living standards may undermine competitiveness. Such confusion can be avoided if we distinguish carefully between short term and longer term issues.

Competitiveness in this longer term sense seems closer to the challenge presented here, if Britain is finally to grapple with its most fundamental problems, problems that have been ongoing for a century or so. Yet, it also seems that the issue presented by competitiveness can pose more

acute problems than what might seem to be a matter of gently slipping behind some of our faster rivals. What makes this so is that the intensity of competition generally appears to advance relentlessly in the longer term, though in the short term cyclical effects may sometimes result in some temporary amelioration.

So far Britain's relative economic decline has been associated with generally rising living standards. The same level of relative performance, if continued in conditions of increasingly intense international competition, risks declining living standards at some point, an altogether less comfortable phenomenon.

At sector level there is already concern that in some cases falling behind rivals has already become an issue of survival: as competitive conditions intensify it is of course those *who are less competitive who are the first to* go. Finally, at the level of the firm the dangers of falling behind rivals in terms of relative growth (loss of market share) have been widely recognised, since at some point the cost position usually becomes untenable because of the "experience" effect (Hedley, 1976). In discussing the causes of corporate collapse Argenti (1976) argues that the problem often "steals up unawares", with intensifying competition finally making its mark either in an unanticipated price war or in the next business downturn.

The seriousness of the problem of allowing the competitive position to erode depends on the likelihood of serious problems in the future and, of course, on how much people feel they have to lose. Both matters call for

knowledge of the particular context and circumstances. The degree of seriousness with which policy makers in Britain regard the issue of competitiveness in the face of other policy trade-offs, will of course depend on views on particular issues, such as whether North Sea Oil can be counted on to provide acceptable living standards in the long term, if the competitive position of major business sectors is not safeguarded.

2.2 Economic literature and the issue of competitiveness

2.21 Classical economics

Adam Smith in his "Wealth of Nations" and later classical and neo-classical economists have argued that sustained growth in the "wealth of a nation" depends on the accumulation of capital. This in turn depends on people's willingness to forsake some degree of consumption (or real wages) in the short term, reflected in savings propensities. An important point is that on this basis competitiveness depends not merely on the absolute level of performance but on the willingness to ease pressure on immediate consumption (real wages): the question of the "penny saved" is more crucial than the "pound earned".

In classical economics competitiveness depends on people's economic choices, particularly in respect to immediate pressure on living standards. A particular problem here is that people and their representatives tend to be myopic as to the effect of immediate choices on future growth in living standards. However, government's most constructive role (short of being able to influence such choices directly) is viewed as one of non-intervention, other than to facilitate the "hidden hand" of the free market. In particular it should not create distortions by attempting to support businesses or business sectors advancing their particular vested interests. Indeed, government should if necessary take active steps to prevent any such group (including trade unions) seriously jeopardising the effective functioning of the market mechanism.

If pressure on immediate living standards (real wage levels) becomes too high classical economics suggests the result will be "voluntary unemployment". People's preferences may push up real wage levels. Transmitted via the price mechanism increased competition will squeeze out marginal business projects, thus raising the marginal product of remaining labour until it matches the new real wage level. Thus a link arises between competitiveness and unemployment. If people display insufficient commitment to long run competitiveness because they are unwilling to forego better living standards today, the effect is to render marginal employees uncompetitive in the labour market, marginal business ventures (or perhaps even marginal business sectors) uncompetitive in the marketplace, and finally to reduce the level of growth that can be sustained in the wealth of the nation.

The main message from classical economics is clear and essentially simple: the main way in which people's choices can contribute to improving competitiveness is by being, if necessary, willing to reduce the pressure of their demands upon immediate living standards.

It is important to distinguish competitiveness in the sense used here from a popular usage of the term, referring to the balance of trade situation of an economy or business sector. In the long term, with which we are concerned, imports and exports must balance for any economy regardless of performance, owing to powerful equilibrating forces such as exchange rate movements. A deteriorating trade balance can be an important indicator of a weak competitive

position; but as Brittan (1984) has pointed out to make "competitiveness" in this limited sense a prime object of policy would, except in extreme circumstances, be to risk a futile zero sum game, and merely encourage beggar-my-neighbour policies. However, competitiveness as defined here, which has to do with competing with better performances in rival countries in respect to sustained growth, is not a futile zero sum game: indeed it is a central problem facing the country. It is therefore wrong for Brittan to conclude that the whole issue of competitiveness is best ignored and that attention can safely be turned to more amenable policy targets such as dealing with inflation.

Exchange rate policy does have a major impact on competitiveness, but it must be recognised that it is merely a special case of the real wage issue. Evidence on UK import and export elasticities (Dornbusch and Fisher, 1980) does not contradict international trade arguments that after allowing for some initial adverse impact due to the "J" curve, a falling exchange rate would make British business sectors more internationally competitive, other things being equal. However the crucial problem, which has led to some disillusionment at the Bank of England, in respect to exchange rate policy, is that wage demands in recent years have taken into account the inflationary impact of devaluation, so as to negate any improvement in the relative cost position within a few years. If so this is merely a special case of the real wage inflexibility issue already discussed, though it could still be worthwhile for governments to play some role if pressure on real wages were

relaxed.

2.22 Keynes

Keynes "General Theory", whilst in large part accepting the classical "equilibrium" model and its assumptions, nevertheless demonstrated that rigidities, in the way in which economic systems actually operate in the real world, could result in disequilibrium phenomena not allowed for in classical theory: because of this there was a case in certain circumstances for a degree of more pragmatic intervention by government, particularly in respect to sustaining the level of aggregate demand.

In the absence of such intervention "involuntary unemployment" could arise (accompanied of course by marginal business activities unnecessarily being rendered uncompetitive), without accurately reflecting people's true preferences in terms of the trade-off they wished to make between real wages and the prevention of unemployment.

> "Men are involuntarily unemployed if, in the event of a small rise in the price of wage-goods relatively to the money-wage, both the aggregate supply of labour willing to work for the current money-wage and the aggregate demand for it at that wage would be greater than the existing volume of employment." Keynes (1936)

It will be noticed that if in fact real wage demands were not flexible, unemployment could not be described as "involuntary" and there would be no case for government intervening to restore aggregate demand. In the context of the 1930's, with price levels in fact falling, Keynes did not believe wage bargaining reflected pressure by labour for any general level of real wages but felt that it was a process directed merely at protecting relative real wages

(differentials).

> "In other words, the struggle about money-wages primarily affects the distribution of the aggregate real wage between different labour groups and not its average amount per unit of employment, which as we shall see depends on a different set of forces. The effect of combination on the part of a group of workers is to protect their relative real wage. The general level of real wages depends on the other forces of the economic system." (Keynes, 1936, p14)

Keynes clarified how his policies would affect the level of real wages if they were to be successful. As output increased (as a result of demand policies) Keynes agreed with the classical assumption that this would result in a decline in the marginal productivity of labour, and since he too maintained the assumption that this was equated to the real wage it followed that the real wage would also fall. Indeed he stressed that demand policies were precisely the mechanism by which labour could be assisted to achieve the reduction in the real wage necessary to restore full employment equilibrium, in the context of difficulties in the wage bargaining process such as differentials and the consequent stickiness of money wages.

> "So long, indeed, as this proposition holds, any means of increasing employment must lead at the same time to a diminution of the marginal product of labour and hence of the rate of wages measured in terms of this product." (Keynes, 1936, pp17,18)

Keynes was aware that any attempt by government to use demand policy to deal with "voluntary unemployment" (ie where the general level of real wages was genuinely inflexible), would be inappropriate and merely lead to inflationary problems.

In summary, according to Keynes governments could and should intervene, through the use of demand policy, to

prevent unnecessary unemployment (or marginal business activities being unnecessarily made uncompetitive), but only so far as people were genuinely prepared to relax demands on the general level of real wages.

2.23 Keynesians and the neo-classical backlash

In more recent years governments have understandably succumbed to the temptation of using demand policies less sensitively than Keynes envisaged to maintain full employment, even beyond the point where people were really prepared to accept a fall in the general level of real wages.

Sustained full employment after the War naturally led employees and unions to the feeling that the traditional trade-off between wage demands and unemployment no longer applied. (Indeed many economists also came to doubt trade-offs such as those implied in the Phillips curve). Increasingly wage targets came to be set in real, and not merely in monetary, terms as people became more aware of the retail price index. But the apparent success in employment terms of Keynesian policies came at the price of increased inflation. The problem arose that the initial benefit of Keynesian demand policies seemed to come through effectively frustrating people's attempts to gain higher real wages. Although money wages were successfully increased, so long as government sustained adequate monetary demand, companies restored acceptable profit margins by increasing price levels. Since the result was merely to frustrate underlying demands in respect to real wage increases, this led to the vicious circle of spiralling inflation, resulting partly

from "cost-push" and partly from "demand-pull".

As Keynes would have anticipated, demand policies became gradually less effective, since real wage flexibility could no longer be assumed. From an immediate policy viewpoint the problem was that an increasing proportion of any injection of aggregate demand was becoming dissipated in price rather than output increases, plus the fact that at some level inflation had anyway to be brought under control.

The inevitable neo-classical backlash, urging an end to Keynesian policies, was supported by research into the longer term implications of governments increasing the money supply. The adoption of monetarism by Britain (and also a number of other governments) is essentially, however, a return to the stricter classical position of non-intervention. The new emphasis on securing more stable longer term conditions was in this respect beneficial to competitiveness, yet it also caused two immediate problems.

First, the sudden shift away from a broadly expansionary stance in fiscal policy had an immediate deflationary effect reinforcing the impact of the world downturn following the oil price hike in 1979. This led to the classic Keynesian step-down multiplier process (accentuated by destocking). Second, employees were slow to anticipate the effect of monetary policy on price levels, company profit margins, and on the real value of wage increases sought, and they were anyway frequently reluctant to acknowledge the tradeoff between real wage increases and unemployment.

Taken together these two factors led to a sharper rise

in unemployment (and more marginal business activities being rendered uncompetitive) in the UK than in many other countries.

The debate between post-War Keynesians and monetarists representing a return to classical economics is clearly still highly contentious, but on balance both extremes appear to have something to learn from each other. The over-use of demand policy, beyond the point envisaged by Keynes himself, where labour is really prepared to relax pressure on the general level of real wages, has often encountered problems such as inflation and may have been counter-productive in some cases (eg France's recent experience). Yet the processes described by Keynes are still very much in evidence, and where there is greater real wage flexibility such as in the USA, demand policies do appear to play a part in reviving business conditions conducive to growth. Even here one must be cautious: the effect on sustained economic performance cannot properly be judged until the backlash as the US is finally forced to deal with its increasing level of debt.

In conclusion, the main way in which economic choices can contribute to conditions conducive to competitiveness is through people being sufficiently committed that they are mutually prepared to relax pressure on real wage levels. Demand policy by government can play some limited role, where such willingness exists. The most beneficial stance by government is probably one that is sensitive to context - if wages and working practices are flexible and inflation is low, there is greater scope for demand policy, but if not it may be that more conservative policies, aimed at at least

restoring more stable long term conditions in respect to inflation, and forcing people to recognise the consequences of their own economic choices, offer at least some advantages.

2.24 Smith's attack on both classical and Keynesian approaches

Having reviewed "The British Economic Crisis", Smith (1984) is critical of both classical and Keynes' models. He argues that policy makers should put a greater priority on dealing with the problem of declining competitiveness, and that they should be prepared to adopt more pragmatic and direct approaches.

Smith (1984, pp128-9) questioned the many assumptions essential to classical General Equilibrium models of the economy, arguing their lack of applicability in modern economics. He cites Professor Frank Hahn as a leading theorist in this field, arguing the dangers of applying such theories to policy making in the real world:

> "I have always regarded General Equilibrium analysis as akin to the mock-up an aircraft engineer might build. My amazement in recent years has accordingly been very great to find that many economists are passing the mock-up of as an airworthy plane, and that politicians, bankers and commentators are scrambling to get seats. This at a time when theorists all over the world have become aware that anything based on this mock-up is unlikely to fly, since it neglects some crucial aspects of the world, the recognition of which will force some drastic redesigning. Moreover at no stage was the mock-up complete; in particular it provided no account of the working of the Invisible Hand..."
> (ibid, pp148-9)

Smith mounts similar attacks on more recent variations on classical equilibrium models, such as the Rational Expectations Hypothesis, citing Frank Blackaby at the

N.I.E.S.R. (ibid, p140). His concluding theme is the damage done as a result of misplaced faith in such general theories by actual policy makers. Again he cites Hahn: "...the vulgarizations of most text-books of economics are both scientifically and politically harmful", and Smith concludes:

> "The problem is that the vulgarizations have, with a vengeance, stepped out of the pages of textbooks, and out of the lecture theatres, where they can only do intellectual damage, into the world of policy making." (ibid, p152)

Having attacked the classical underpinnings of both monetary policy specifically and of undue faith in free market "laissez faire" more generally, Smith goes on to argue that Keynesian policies contain many of the same assumptions. More importantly however, they are anyway inapplicable to dealing with the realities of declining UK competitiveness as outlined earlier in his argument. He concludes his criticism of Keynesian approaches such as demand management with an attack as follows:

> "But policy interventions of that type seem to offer little in the face of the problems outlined in the first section of this book. These problems are specific ones concerning manufacturing performance, and the R & D, investment, engineering and education inputs to that performance. Keynesian policies of demand management are aimed elsewhere; they are pitched at an abstract level which brackets out the specific problems of industrial organisation which face Britain. For this reason it is necessary to explore such problems directly, without relying on policy panaceas derived from the highly abstract preoccupations of theoretical economics. It is not that theoretical economics is not important, not a worthwhile and necessary activity. It is simply that it is time for politicians and others to stop thinking that it can offer simple answers." (ibid, p183)

Smith further argues that such misplaced faith in general economic approaches to policy making has dangerously

distracted attention from dealing with the real issue of declining competitiveness:

> "The tragic consequence of all this has been a concentration of attention by British politicians on economic issues which are to a greater or lesser extent peripheral to our real and urgent problems; in effect, they have not seen the wood for the trees. If the crisis is to be resolved, therefore, future policies must abandon what might politely be called the "indirectness" of past and present policy measures. Policies should be based on a much more realistic assessment of our future prospects, and of the mechanisms that have made them so bleak."
> (ibid, p200)

Smith concludes by recommending more pragmatic and specific policy approaches of the type successfully adopted in Japan, showing how a number of policy successes have hinged on specifically rejecting general economic arguments adhered to in the West. He cites Mr Y. Ojima, Vice-Minister for International Trade and Industry, as stating that it was

> "decided to establish in Japan industries which require intensive employment of capital and technology, industries that in consideration of comparative costs of production should be the most inappropriate for Japan, industries such as steel, oil refinery, petrochemicals, automobiles, aircraft, industrial machinery of all sorts, and electronics including electronic computers. From a short-run static viewpoint, encouragement of such industries would seem to conflict with economic rationalism. But from a long-range viewpoint, these are precisely the industries where ... demand is high, technological progress is rapid, and labour productivity rises fast."
> (ibid, p220)

Thus with such a clear commitment to the long run growth and competitiveness of their industries, the Japanese appear to be aware of the dangers implicit in over-general economic arguments and of the need always to remember the overriding priority of "competitiveness".

2.25 Other writers

Smith (op cit, 1984) provides a good example of much

recent economic literature dealing with "Britain's Crisis". Variations on this theme can be seen in Glyn and Harrison (1980), Eatwell (1982), Williams, Williams and Thomas (1983), and Pollard (1982). Literature analysing the success of Japanese economic policies also supports Smith's theme, for example G.C.Allen (1980). Many of these writers further develop the view that again and again Britain, partly as a result of institutions and attitudes, has sacrificed the profitability and competitiveness of its businesses on the altar of other goals. The broad conclusion is the same: there is a need for a more decisive commitment to positive development of our business sectors, particularly that of manufacturing.

Pollard notes the generalist background and affinity of those in many institutions such as the Treasury, which predispose them towards general policy measures: indeed he sees them as almost addicted to the more "symbolic" goals of economic management. Attitudes of many involved in the political decision making process, he argues, are inherently geared to the short term and still reflect a contempt for what is happening in specific business sectors. The contempt for what is happening at the level of production also extends he feels to unions, who having lost confidence in their company's ability to win future business are ambivalent about ensuring companies keep ahead in terms of production developments aimed at maximising efficiency.

The linkage of British economic decline and "generalist" attitudes has been noted by Wiener (1981) as an almost cultural phenomenon, deeply rooted in history and in

the educational system. Moreover Dahrendorf (1982) links Britain's poor economic performance to the traditional cultural virtue of tolerance. Alas, it seems that tolerance extends equally to a rather complacent acceptance of allowing the competitiveness of businesses to become eroded. Certainly a cursory inspection of Britain's history suggests that the country has not always been exactly tolerant of its more committed leaders, until situations have actually reached crisis point, from Clive of India to Churchill. It might appear that the other face of "tolerance" is a certain contempt for "commitment", that is until crises finally jolt the British people into responsiveness.

Britain's lack of commitment to the rapid development of its business sectors also of course reflects the greater priority afforded to other goals doubtless laudable in themselves. The investment that Pollard feels has been a key problem has been in turn crowded out by consumption today, either through real wage levels being too high or through resources going into public services which have only at best an indirect effect on assisting business competitiveness. Many writers have pinpointed particular aspects of this problem, manifest not least in the cost and availability of funding for productive investment. Particular issues raised include issues as various as housing subsidies and mortgage relief, non-repayable student grants, the welfare state generally, and so on.

Yet these issues may be summarised as further manifestations of a lack of commitment to business competitiveness in terms of policy priorities. This argument is broadly summed up in Bacon and Eltis (1978):

the productive sector of the ecomomy (defined essentially as businesses in the free market sector of the economy) is seen as having been critically weakened by a premature dissipation of resources into other activities, the public sector in particular. It is of course a question not merely of whether the UK diverts more resources than other rivals such as Germany into housing, education or the public sector, but of timing; for premature moves in this direction may have damaged the competitiveness of our business sectors so that they are now too weak to support the weight of other activities which they are required to bear.

Many of the chronic economic problems which have dogged progress in the UK, such as balance of payments problems leading to stop-go policies and to some extent inflation, and with which economic advisors have become so preoccupied, may in this light be seen merely as symptoms of a more fundamental problem - the problem that Britain has not been prepared to make the trade-offs that would have allowed its business sectors sufficient resources to ensure a competitive future. This supports the argument that Britain's top priority should be to divert resources back to business to rebuild competitiveness.

The issue of "deindustrialisation" has come to the fore in recent years in a number of conferences and publications, eg Blackaby (1979), and there is also a growing recognition that many of the problems are too deep rooted to be tackled by macroeconomic policies alone. Caves and Krause's (1980) review of the situation cites Posner's four teams: having

simulated effects of radically different macroeconomic policies over many years, they found remarkably little difference would have resulted in Britain's present position. The only exception seems to have been that all teams agreed that Britain made a mistake in not devaluing prior to 1967 - a policy move that might have improved the relative cost position of British business.

Neither do Britain's problems seem to result from being in the wrong business sectors. Panic and Rahjan (1971) showed the UK was not unduly hampered in terms of its share of faster growing manufacturing exports: in 1968 59% of UK exports came into the faster growing categories, compared with the USA 74%, Germany 64%, France 56%, Japan 47%, and Belgium 36%. This casts doubt on the idea that the UK's key problem is one of getting out of "sunset industries" and into "sunrise industries".

Economists and other commentators have recognised the need to turn their attention to more basic micro-level issues in diagnosing Britain's performance problem. Stout (1977) and Connell (1979) have shown that the problem was to a considerable extent one of non-price competitiveness, pointing to issues such as design, bad marketing, late delivery, and poor after-sales service. Connell (1979) showed for example German exports of mechanical engineering goods were worth 60% more per ton than British export goods in the same sector. Research at the Science Policy Unit at Sussex University more generally points to the key role in competitiveness played by technology (Pavitt, 1980) and the same point has been made by others, eg Millman (1983). Productivity differentials between the UK and other rival

countries, evidenced by Pratten (1976b, Prais (1981), and the Central Policy Review Staff (1975), point to the need to push analysis on from rather broad analysis to the situation within business sectors and firms, and also down to the level of the shop floor.

Yet we still need a way to provide a more balanced picture of the competitiveness problem, to link policy analysis at the macro level (which clearly does affect business competitiveness) with greater recognition of the situation within business sectors. Without this it is difficult for policy makers to get a feel for the trade-offs involved. For example Dunnet (1980) demonstrated the danger of government pursuing economic policies without adequate sensitivity as to their effect on business sectors such as the car industry. Policy makers could make use of a more reasonably balanced and also more specific analysis of the situation, and it does appear that they are now becoming more sensitive to the impact of fluctuations in policy (such as sudden changes in taxation, hire purchase arrangements and indeed stop-go policy generally) on the competitive situation of major business sectors.

Another milestone in this respect is Williams, Williams and Thomas (1983) who try to balance a broader analysis of the way in which Britain has permitted manufacturing business sectors to decline with three cases detailing the competitive situation in particular industries. This also allows the dimension of company policies to be drawn into the analysis.

Thanks to the work of NEDO, SPRU and other research

bodies, there is an increasing wealth of studies analysing competition within particular business sectors.

There does however appear to be a gap in the literature between fairly aggregated economic studies, which are perhaps over-general, and more detailed studies of competition within specialist business sectors, which are difficult to relate back to the broader picture. It is hoped this study of a large and complex sector will help to fill this gap and also complement other studies.

2.3 Competitiveness in the context of literature on business strategy

2.31 Introduction

Business competitiveness may therefore be assisted by more appropriate economic choices, but finally the issue depends on performance at the level of the firm. Literature in the field of management and business strategy provides many concepts and analytical tools useful in this context.

Historically these ideas have developed to meet the needs of enterprises, that have grown larger and more complex, faced with changing and increasingly severe competitive circumstances. Also since the days of small owner-managed firms, new "stakeholders" such as government and trade unions have emerged, creating a demand for new tools of analysis (Thomas, 1981 and 1983). The pattern of business evolution, since most businesses really took off in the late 19th century, has been described in Chandler (1962) and this work provides a useful framework for tracing the evolution of these analytical concepts (Hofer and Schendel, 1980). It is convenient to review past approaches to business strategy in stages broadly corresponding to their historical development.

2.32 Entrepreneurial approaches

At an early stage in the development of business strategic decisions were typically taken by an owner-manager or entrepreneur, just as in many small businesses today. Few formalised analytical techniques were involved: the entrepreneur relied heavily on initiative, experience and

judgement, and perhaps some creative vision. Even in the modern sophisticated world it would be unwise to ignore the simple, though powerful, principles through which successful entrepreneurs secure competitiveness.

Ohmae (1982) argues that the success of many large Japanese corporations, such as Sony and Honda, is due not to the application of complex analytical techniques or strategic decision making processes, but to the type of creative flair and total competitive commitment characteristic of entrepreneurial approaches. He cites the boldness and commitment of leaders such as Konosuke Matsushita and Soichiro Honda in the execution of their plans regardless of minor shifts in circumstances; by contrast, he argues, the detailed sophisticated planning characteristic of bureaucratic organisations makes "about as much sense as rearranging the deckchairs on the Titanic" (ibid, p82). Furthermore, he continues, "all of today's industry leaders, without exception, began by bold deployment of strategies based on KFS" (key success factors).

Successful entrepreneurs frequently exhibit decisive market entry strategies, respond quickly to opportunities, and subsequently retain a clear notion of their business's intended basis of competitive advantage - all characteristics highlighted in one recent study of successful business strategies (Doyle, Saunders and Wong, 1985, pp10 and 18). The same study also supports the decisive commitment displayed by many entrepreneurs in securing a competitive niche in the market place, even, if

necessary, at the expense of short term profitability.

Such commitment is also manifest in being prepared to accept risks where necessary, as Ohmae (1982, p49) argues:

> "The strategist must have the courage to gamble and accept the risks involved. This gamble - the strategic decision - is the narrow gate through which a company must pass if it is to win superiority in the demanding field of competitive business, practical only in head-on competition."

Having committed himself to early investments, the entrepreneur is keenly aware that any shortfall in future commitment or future investment creates the risk of bankruptcy and of rendering valueless all such costs should it result in competitors getting ahead. Again many larger corporations today have been able to improve competitive performance by taking simple steps to ensure directors' personal stakes are a little more in line with those of committed entrepreneurs.

Successful entrepreneurs often seem to have been remarkably ignorant in respect to financial and other analytical techniques. I would suggest this may be due to two related compensating strengths, a particular sensitivity to more contextual matters and leadership.

Many examples of entrepreneurial approaches today are manifest in small business activities. There seems increasing awareness by bank managers vetting such small business proposals (as well as in the literature in this area) that impressive financial figuring is not enough, and that their quality in respect to detailed contextual issues may often be a better predictor of success. This is a reminder that effective strategy thinking must not be superficial: it must of course be cogent, but it is also

often essential that attention should be guided logically towards more specific, often quite technical, issues of key significance.

The natural stress in all analytical concepts and techniques tends to be on principles of general application. A danger is a tendency to downplay the strategic importance of more specific contextual issues. For example Andrews (1971) advances his first chapter "The Importance of Being General" but does not balance his argument by reminding readers that effective strategy thinking can rarely afford to stop at the general level or it is likely to be superficial. This point is perhaps particularly poignant in a British context, since the problem of declining British competitiveness has been partly linked to a generalist bias in British culture, and particularly in the culture of managers (Wiener, 1981, and Terry, 1979).

The willingness to pay commensurate attention to more specific and detailed issues leads to a fuller appreciation of the strategic contribution made by people working on more specific tasks, for example in the production area. By contrast Andrews' defence of a more generalist approach is in danger of encouraging elitism and contempt for technical details or mere functional specialists:

> "The generalist above all cannot allow himself to be intimidated by the language, demeanor, and organisational insensitivity of his highly educated subordinates ... The successful generalist survives and succeeds in a specialised world by virtue of his management skills rather than his technical knowledge" (Andrews, 1971, pp20-21)

The point is of practical importance in strategy implementation. Germany's better performance in toolmaking, for example, has been attributed to relationships between

German managers and functional staff/employees being more "continuous and contiguous", leading to greater employee commitment and fewer industrial relations problems (NEDO, 1981). Again recent literature suggests such simple principles as "management by walking about" apply equally to large corporations (Peters and Waterman, 1984; and Goldsmith and Clutterbuck, 1984).

The influence of cultural factors, at a corporate level, on competitiveness has become increasingly recognised (Hofstede, 1980). The entrepreneur's response is leadership. He is aided by a simple, communicable sense of direction, often lacking in bureaucratic organisations, and by a sensitivity to issues and people based on intimate involvement: a simple principle that has survived the test of time (Barnard, 1972; Follett, 1973; McCarthy, Minichiello and Curran, 1979, p131; and Prior, 1977). Indeed perhaps the essence of leadership is to transform the pervading culture and ethos.

From leadership comes commitment, and with sufficient commitment and ability competitiveness can always be improved. The ultimate test, however, as discussed in the last section, is the willingness if necessary to accept lower real income levels until the competitive position is restored, something many entrepreneurs seem prepared to do when the occasion demands.

The entrepreneurial approach is a reminder that, for those really concerned, the issue of competitiveness is not just a problem in optimisation, but is often a question of an organisation's survival, particularly as competition

intensifies. This harsh fact calls for a quite different attitude to that prevalent in bureaucratic organisations: as Ohmae (1982) has put it, "it is the difference between going on a diet and going into battle". Indeed as modern writers have noted, those involved in business strategy have much to learn from military strategy (Quinn, 1980).

In summary, the key strengths characteristic of entrepreneurial approaches to strategy are a sensitivity to context and the degree of competitive commitment. In reviewing more sophisticated approaches to strategy it is hoped such simple principles will not become eclipsed.

2.33 Financial approach

Few organisations, even non-profitmaking ones, can ignore financial analysis if they hope to remain competitive. Historically, the increased influence of finance was probably associated with industrial consolidation. Horngren (1984, p18) cites US surveys indicating that "more chief executive officers began their career in an accounting position than in any other area such as marketing, production or engineering". Recently, he believes, the influence of finance has increased as a result of high inflation and persistent recession. Business Week (15 August 1982, p84) also indicated that controllers

> "... are now getting involved with the operating side of the company, where they give advice and influence production, marketing and investment decisions as well as corporate planning."

Inadequate attention to the financial situation, both to profitability and also cash flow, may in the extreme result in collapse and competitiveness can scarcely be

assured without continued financial viability in the short term! Apart from the usual accountancy techniques and the use of more specialised ratio analysis such as Z scores, a substantial literature has emerged for those concerned to avoid such pitfalls. Generally such problems can be traced back to ineffective management, though economic conditions also have some effect (Argenti, 1976). A related and more common problem, receiving more attention in today's more competitive conditions, is that of retaining competitiveness in less extreme situations, where it is nevertheless necessary to turn around performance rapidly to avoid collapse (Slatter, 1984; and Bibeault, 1981).

Apart from these fairly extreme circumstances, financial analysis reminds us that sustainable growth can only be achieved if care is taken to maintain a business in balance. Expansion or diversification has constantly to be balanced against the need for retrenchment and rationalisation, for without some "pruning" financial, managerial and other resources will become overstretched, weakening the competitive position and the foundations of further growth. Financial analysis assists an organisation to evaluate its "portfolio" of activities (whether products or entire divisions) to ensure profitability (or cash flow) is adequate to justify future inclusion.

Current cost accounting has emerged to ensure those really concerned to maintain their competitive position in the longer term are fully aware of additional provisions needed to allow for the effects of inflation (it is less relevant for businesses which may ultimately wish to withdraw from activities concerned).

Clearly those concerned with ensuring competitiveness must be sensitive to these and other issues raised by financial analysis, but some reservations should also be made. Financial analysis is of course only the starting point in assessing an organisation's strategic situation: Buchele (1967) enumerates several limitations.

Recently a number of writers have produced forceful arguments that financial techniques can prove misleading in some circumstances, and that in particular an overemphasis on financial analysis may have led to declining competitiveness in the case of US industries (Hayes and Garvin, 1982; Hayes and Abernathy, 1980). In Britain the case of Norton-Villiers-Triumph is often cited as a case of over-cautious financial policies resulting in a situation of competitive retreat and ultimately collapse (Boston Consulting Group, 1975).

Another potential danger is that superficial use of financial techniques could encourage complacent organisations, unwilling to tackle specific problems (for example manning levels in production), to recover financial control through premature retrenchment or rationalisation. Financial crises may be put off for many years, and profitability can probably be sustained at reasonable if not exciting levels; but the real cost, in insulating management from their more specific problems, is paid through retreat in the marketplace, so that competitiveness suffers accordingly. Costs associated with retrenchment are inherently difficult to handle when making financial appraisals and rarely receive adequate attention.

It may also be possible, if unpleasant, to restore financial performance in marginal areas on projects, if people can be persuaded to reduce pressure on real wage levels - this of course changes the basis of all financial appraisals. Recent American experience suggests that given greater commitment by management and employees, real wage flexibility can play an important role in restoring competitiveness.

In general, however, financial systems and controls play an important role in coordination and in enhancing people's commitment throughout organisations. Used effectively, they may perhaps be considered as laying the foundations of sustainable growth, and can contribute greatly to an organisation's competitiveness, a well documented example being the case of Norcros (see Channon, 1971).

2.34 Marketing

The first effect of increasing competition, in the context of efficient financial markets and the changing structure of British business, had been to increase the importance of financial analysis in strategic decisions; but a rising proportion of discretionary spending following the Second World War, coupled with further competition, made necessary a greater recognition of the strategic importance of marketing considerations. Organisations could no longer assume customers would buy their products just because they were the lowest cost producers, as Ford had found to its cost some years earlier when its market position was overtaken by General Motors.

Levitt's classic article "Marketing Myopia" (1965) evidenced many examples of organisations whose competitiveness had declined as a result of failing to respond adequately to changing customer needs; in the long run profits ensued only by doing so. To do so more effectively organisations could track their target market segments closely and orientate their operations accordingly. Product *portfolios* being offered could be evaluated against "product life cycles".

The new "marketing concept" involved a different organisational philosophy. A product-centred approach was advocated, with each centre the responsibility of a product manager. Such a manager could liaise and coordinate with the various functional areas to ensure the best final "mix" from the viewpoint of satisfying the target customer's needs effectively. To ensure competitiveness it was essential to commit the organisation totally to the task of responding adequately to changes in the external marketplace. Indeed more recent interpretations stress the subtler organisational issues in addition to the armoury of marketing weapons, such as the four "p"s.

There is evidence of British organisations being less marketing orientated than, for example, their Japanese counterparts (Doyle, Saunders and Wong, 1985). The same study also indicates that more successful organisations were more committed to their market positions, even where this involved some trade-off in short term profitability.

The concept of commitment is valuable. Naive over-eagerness to follow market changes could lead to an over-

emphasis on faster growing market segments at the expense of premature abandonment of slow growth segments. Obtaining a proper balance demands sensitivity to an organisation's particular competitive circumstances. Whilst higher growth market sectors may often be associated with higher long term profitability, this is not true of all. Hall (1980) identifies a number of US companies in eight mature industrial sectors exhibiting outstanding performance; nor were they even market leaders.

Even basic ideas such as product or industry "life cycles" are still contentious. Van Rossum (1984), for example, argues: "The glaring fallacy is the underlying assumption that death is inevitable, that the cycle is ultimately determined by predestination". In reply, Arthur D Little's Philip Middleton (1984) demonstrates that life cycle concepts continue to be useful tools of strategic analysis, but he does not fully acknowledge the danger of encouraging premature and inappropriate loss of competitive commitment that might result in the case of some products.

The point applies particularly to the motor industry, which has until recently been regarded as a mature industry. On this analysis further investment in BL, particularly as a low market share contender, might have been discouraged. Recent more detailed examination of the specific competitive circumstances in this industry have shown that a process of "dematurity" is now taking place and that such pessimism would have been unwarranted (Altshuler et al, 1984; Jones, 1981; Chew, 1984).

2.35 Other functional areas

Levitt (1965) had argued that many US railroad companies had failed because, instead of defining themselves in terms of customer needs for transportation, they had placed too much emphasis on distinctive operational characteristics, ie of operating railways. Yet this inherent tendency in the marketing approach, to define the business in terms of products or services, could also prove dangerous. An organisation might well have far more resources and competitive advantages vested in operational assets and skills than on the marketing side, where the potential synergy could well be very low, particularly for business sectors such as automotive components manufacture.

Skinner (1978 and 1985) demonstrated the strategic importance of manufacturing considerations, pointing out that downplaying these could have the result that "a function that could be a valuable asset and tool of corporate strategy [could become] a liability instead". Skinner's findings have been further endorsed by other writers and the importance of manufacturing / operations strategy is now widely recognised (Hill, 1983; Hayes and Wheelwright, 1984).

Further endorsement has come from research suggesting that manufacturing policy has been a distinguishing feature of the Japanese approach to strategy, and one that has underpinned their competitive success in industries such as automobiles. Abernathy et al (1982) concludes:

> "Managers must recognise they have entered a period of competition that requires of them a technology-driven strategy, a mastery of efficient production, and an unprecedented capacity for workforce management."

Also noteworthy is a broader vision contained in the same article: that if the wider issue of industrial competitiveness is to be addressed then policy makers at the macro level as well as at the level of the firm must appreciate the key importance of such issues:

> "Managing change successfully proved difficult because policy makers in business and government, trained in an old economic calculus, have found it hard to see the new competitive realities for what they are - or to identify the best terms in which to analyse them.
>
> "Policy makers fail to understand that the old rules of thumb and worn assumptions no longer hold ... As a result, decision makers who continue to act as if nothing has happened are, at best, ineffective and, at worst, inadvertent agents of economic disaster."

For those concerned with identifying key strategic issues at the level of the firm, clearly the importance of different functional areas such as manufacturing and marketing varies depending on the particular business sector and circumstances. Those advocating a greater role for manufacturing policy in strategic thinking must of course recognise the importance of financial and marketing issues, but their point that more specific production issues often prove to be of key importance is a timely reminder of the need for a balanced approach.

Those concerned to ensure an organisation's continued competitiveness must therefore not only be sensitive to issues raised by financial or marketing appraisals, but also be prepared to give commensurate attention to more specific issues in areas such as production. Depending on the organisation's particular strategic context, even quite mundane matters may emerge as being of key importance to continued competitiveness: for example in one industry

Garvin (1983) traced the key reasons for Japan's success against US competitors to manufacturing policies resulting in better levels of quality.

Again these issues have wider implications for the way in which businesses organise. Thus if production issues are found to be of key importance, it may be necessary to deal with issues such as power, status, remuneration, training and organisational arrangements.

In the UK there has been considerable concern about production becoming a "Cinderella function" in the face of increasingly powerful staff functions such as accountancy and marketing. There is also substantial evidence suggesting that the UK is particularly weak in the area of manufacturing policy. Comparative international studies by Hutton and Lawrence (1978 and 1979) for example have pinpointed Britain's competitive weakness in comparison to Germany in the area of production management.

Production may be a particularly serious area of neglect in the UK. However there would seem to be similar dangers in neglecting some other functional areas. Hutton and Lawrence's study (1981) also points to Britain's weakness in engineering, and research at the University of Sussex's Science Policy Research Unit has evidenced the key role played by technology in determining competitive success in a number of industries (Pavitt, 1980). The impact of Pilkington's float glass process in 1958 on the pattern of competition is perhaps the classic example of this.

By now most fundamental areas have argued for a more central role in strategy formulation, not least because such arguments provide the rationale for additional power and

prestige. The fields of industrial relations and personnel management understandably argue that in the long run organisations only achieve success through the careful selection and management of the people who make up the organisation. Arguments put forward by the procurement function are perhaps particularly pertinent to the components industry (Bailey and Farmer, 1981). Organisational experts have argued the key importance of addressing organisational issues such as appropriate structure (particularly in the context of more diversified organisations) and corporate culture (Channon, 1973; Hofstede, 1980; Miles and Snow, 1978).

Given a multitude of such arguments, it is clear that if the issue of competitiveness is to be fully addressed a contextual approach, sensitive to such various issues, is required. In practice, successful executives are reluctant to place too much emphasis on general theoretically based approaches and rely heavily on more specific knowledge of their businesses (Peters and Waterman, 1984). Where their intuition and judgement suggest particular developments may be important to their competitive situation, evidence suggests they are often prepared to override conclusions suggested by analytical tools such as financial analysis for example (Donaldson and Lorsch, 1984).

2.36 Strategic Implications of Market Share

2.361 Experience effects

A powerful approach raising some important strategic issues has emerged out of the Boston Consulting Group's

research on the experience curve. Having demonstrated that unit costs tend to fall by a set proportion, roughly between 20% and 30%, every time accumulated production doubles it was but a short step to the recognition of the strategic importance of market share (Boston Consulting Group, 1968 and 1975; Hedley, 1977). In the long run high share companies ought to dominate business sectors since their costs ought to fall faster than competitors'. There are provisos of course, such as the need for careful business definition. Benefits do not derive automatically from experience, but require considerable organisational commitment. Product innovation can discount the benefit of experience gained on earlier products.

Statistical evidence presented by the BCG is anything but solid. Data obtained frequently hinged on price data as a proxy for cost data, and many industries do not conform to the broader picture the BCG seek to establish. Porter (1980) for example evidences a number of industries in the USA where the market leaders are considerably less profitable than the followers.

Such analysis has nevertheless been particularly useful in highlighting key competitive issues in technology-driven industries such as electronic calculators, and the importance of these ideas was perhaps illustrated by the domination of this market in the USA by Texas Instruments, a major proponent of this approach. The power of the concept was enhanced through organisational changes and new control systems, so that competitive commitment could be harnessed throughout the organisation - indeed it is a good example of how strategy analysis can transform corporate culture.

This said, such ideas advocated by the BCG are scarcely foolproof, as exemplified by Texas Instruments' more recent problems in the cases of digital watches, telecommunications, and mincomputers - problems attributed by Uttal (1982) directly to this very approach. What is most potentially dangerous is where such ideas about the advantages of high market share actually lead to businesses cutting back their commitment to remaining competitive in other business units (eg by corporate headquarters deliberately reducing investment). The advantages of market share are generally corroborated by figures published by PIMS (Schoeffler et al, 1974) which suggest return on investment for companies with relative market shares over 80% average three times that for companies with market shares under 20%. However researchers utilising the same database have demonstrated that there are numerous exceptional situations where low share companies do extremely well, particularly where attention is given to carefully constructed competitive strategies (Woo and Cooper, 1982). Not all their evidence entirely contradicts BCG's recommended approaches (eg the fact that focused strategies emerge as a key characteristic of more successful low share companies makes one suspect poor business definition, a crucial point made by the BCG); however it certainly gives the lie to any notion that low share companies are inevitably doomed.

Other research also underlines this point. In the case of declining industries Hall (1980) also evidenced the success of many low share companies. Newton (1983) also

evidences many industries where low share companies have consistently outperformed high share companies over many years: Rugby Portland Cement for instance achieved twice the return achieved by the two UK market leaders over many years whilst at the same time building market share. This evidence suggests that companies should be extremely wary about allowing market share ideas to undermine competitive commitment, and they should certainly look very long and hard at the specifics of their own competitive situation first. Ideas that are true more often than not may well prove to be quite wrong in their specific situation!

There is also another quirk in the BCG's earlier findings which has not been much enlarged on since. Boston Consulting Group (1975) deals at some length with the problem of exchange rate movements whose impact they found could be even greater than that of experience curves. Thus although Japanese motorcycles displayed typical experience curves with costs calculated in yen, the same curves expressed in dollars were actually slightly upward sloping. BCG therefore recognise that where international competition is being considered it is necessary to adjust for exchange rate trends. This is in fact merely a special case of a more general proviso already noted: that any differences between competitors in real wage levels, and any trend differences, must always be taken into account.

2.362 Portfolio Approaches and PIMS

Experience effects raise portfolio issues of particular significance to larger company groupings. Here the recent impact of BCG and other portfolio approaches, which

highlight such issues, has been considerable. Haspeslaugh (1982) estimated that 49% of US Fortune 500 corporations employed some type of portfolio matrix approach in their planning.

The same points as in the last section also apply here. The danger of such approaches leading to some premature loss of total competitive commitment is particularly apparent. Only in the case of high growth / high share "star" business units, and some high growth / low share "question mark" business units - not a very high proportion of most company groups today - is anything like full competitive commitment suggested; in other cases it is explicitly discouraged! The latter situations also raise serious organisational problems.

Of a number of variants, Shell's Directional Policy Matrix explicitly deals with shortcomings due to equating "market attractiveness" with simply "growth", and equating "strength of competitive position" with merely "market share" (Coate, 1983). Yet additional sophistication and realism is gained only through a large number of fairly subjective evaluations.

With its ability to handle many exploratory variables the PIMS approach, outlined by Schoeffler et al (1974), is particularly sophisticated and its database is increasingly powerful. The model also offers considerable flexibility. Yet there is no supporting theoretical model to justify the causal links suggested by their 37 variable equation. Impressive accuracy from what is essentially an ex-post line of best fit has to be judged with caution. Also however

accurately their equations describe the behaviour of their chosen population of predominantly large US companies, they may not hold well in particular sectors. Thus, although this approach again raises questions of strategic interest, its advocates are correct in warning that their results should be treated as "directional indicators" and not as a substitute for managerial judgments. The latter point perhaps applies to all analytical techniques.

2.37 Porter's Approach

More recently Michael Porter's best selling "Competitive Strategy: Techniques for Analysing Industries and Competitors" (1980) has been influential, particularly upon US businessmen. This approach forces those involved in strategy to analyse the underlying competitive dynamics that apply to a business's specific situation. A framework for approaching the problem is supplied, as are generic guidelines for a number of competitive situations (fragmented industries, emerging industries, the transition to maturity stage, industries characterised by global patterns of competition), and for a number of generic strategic options (vertical integration, capacity expansion, entry into new businesses). This is valuable in that it is then possible to integrate this general framework and the general guidelines it offers with more specific knowledge of the business's circumstances.

Porter's framework also offers the possibility of extension. More empirical work by other researchers means that understanding the keys to competitive success in such generic situations can be continuously improved: see for

example Harrigan (1980) on declining businesses and Harrigan (1984) on vertical integration. Porter's approach is supported by rich examples of industry competition. At this stage these are necessarily limited to somewhat thumbnail sketches (see for example Hout, Porter and Rudden, 1982, "How Global Competitors Win Out" - not everyone would completely agree with this three page analysis of Caterpillar's competitive position vis a vis Komatsu in the light of subsequent evidence). However as more detailed studies emerge, analysing key competitive issues in particular industries in greater depth (for example Toyne et al's "The Global Textile Industry" 1984, and studies similar to my own now being carried out under Prof. B.T.Houlden at the University of Warwick) it should be possible to provide greater depth to the overall approach.

Many of Porter's strategic guidelines make use of matrix portfolio approaches already discussed and as such are subject to many of the same reservations, but there are additional potential dangers from the viewpoint of competitiveness in Porter's approach.

Porter's approach is directed towards achieving defensible niches in which there is potential for some degree of monopoly. Otherwise, from an economic viewpoint, free markets must in theory eventually destroy any possiblity of profitability (beyond the cost of capital, with some allowance for risk) through new competitors entering the market. Porter draws on economics literature originally directed to explaining monopolistic and oligopolistic competition, such as work on entry barriers,

in order to draw up ground rules for the way companies can direct themselves to areas of less intense competition.

> "The intensity of competition in an industry is neither a matter of coincidence nor bad luck. Rather, competition in an industry is rooted in its underlying economic situation and goes well beyond the behaviour of current competitors."
> (Porter, 1980)

It is important for management to understand and manage this situation.

Economic models, however, explicitly assume that all competitors are equally efficient and that factors of production are given for any operation. This may be a useful assumption in the explanation of the behaviour of some markets, but it is a poor assumption in understanding the situation between competitors. The existence of considerable residual productivity differentials between companies and countries, even after allowing for type of equipment, scale etc is well documented (Pratten, 1976a and b; CPRS, 1975). Even small improvements here or in other areas of efficiency make an enormous impact on residual profit margins and ROCE. Leibenstein (1966) demonstrated moreover not only the importance of such efficiency differentials in comparison to gains possible through allocative efficiency (Porter's arguments lie in the latter area of economic theory), but he also demonstrated the importance of changes in X-efficiency in determining competitive behaviour among companies.

Porter may well feel that in the long run efficiency differentials against both actual and potential competitors are less important from the viewpoint of strategy than the gains from achieving a position of less intense competition,

but this thesis is not fully supported. Moreover in the long term even a reasonable degree of monopoly power may well prove unsustainable as its existence sets up many countervailing forces. It should also be noted that the increasing power of product and process changes continually undermine any gains through monopoly power.

Many of Porter's themes are essentially exploitational. The key strategic issues on which he focuses attention are how a company can achieve less intense competition, rather than the key issues it needs to face in order to improve its own performance and effectiveness relative to that of competitors. In the long term this approach is likely to prove extremely dangerous. Firstly, particularly in markets characterised by longer term business relationships such as industrial markets, it is well established that prices are considerably influenced by the notion of the fair price (Bailey and Farmer, 1981), which limits exploitational possibilities. In the case of automotive component suppliers, Ford for example have sophisticated procedures for undermining attempts by any supplier to increase their degree of monopoly/exploitation.

Secondly, the intensity of competition is relentlessly increasing. Any company that achieves some temporary cushioning against competition is likely to adapt accordingly with overheads and inefficiency tending to increase (see Leibenstein, 1966), and many gains will be eroded by additional wage settlements (others can play the power game too). Ultimately competition will anyway intensify. Probably in the next severe downturn, price levels will fall towards minimum cost levels. In this

situation any companies which have not maintained maximum pressure on cost reduction may later find their advantageous bargaining position with respect to customers has anyway become eroded. Any company that is relying on a marginally better bargaining position may well find that it becomes "locked in" to a more cushy "high cost" position. Others showing greater commitment to increasing internal efficiency and effectiveness may prove leaner, fitter and more adaptable in the face of the next wave of intense competition. This may prove of far greater benefit than any small gains possible through bargaining power.

Porter's book (1980) ignores the issue of real wages not being the same for all competitors. This is particularly important in the context of global competition in which he takes a particular interest. The whole basis of international trade theory in economics, the concept of comparative advantage (see for example Ohlin, 1933) is that over long periods of time real exchange rates in competitive countries will move to offset competitive advantages achieved by one country over another. It is well recognised that considerable productivity differentials exist between countries offset by real wage adjustments. By discounting both factors Porter's position here seems inconsistent with international trade theory. The Boston Consulting Group's international work does recognise the need to allow for varying exchange rates. Porter's approach may therefore risk underplaying the effects of real wage rate variations.

2.38 Structural and organisational issues

The evolution of businesses into complex multiproduct organisations, noted by Chandler (1962) and corroborated by subsequent research in many countries including Britain, has itself raised issues of strategic importance (Channon, 1973; Rumelt, 1974; Dyas and Thanheiser, 1976).

The promise of faster growth and risk reduction presented by diversification or acquisition has received cautious support in some recent research though the impact on profitability has been more ambiguous (Newbould and Luffmann, 1978). In the case of mergers and acquisitions a multitude of research studies have resulted in no conclusive support in respect to improved financial performance, and on balance would suggest some degree of cynicism, particularly from the viewpoint of acquirers, since any net benefit seems to be often absorbed in the price premium paid to shareholders of organisations acquired (Singh, 1972; Kitching, 1967).

However to date such studies have been at a fairly aggregate level. Literature on business strategy would suggest that benefits from such policies would depend on how appropriate they were to the particular situations of companies involved, and how effectively they were implemented. Lubatkin (1983) suggests this would call for subtler research methods, so that some assessment of the business logic or synergy expected could be taken into account.

One might expect the presence or absence of "synergy", discussed in earlier literature (Ansoff, 1968) to be

important, but although Rumelt (1974) found some support for the idea that diversifications into related activities were in general more successful, there has also been evidence to suggest acquisitions in totally different fields are just as successful (Hogarty, 1970).

Evidence does suggest that the manner in which acquisitions are planned and executed is important in determining success or failure. Ansoff (1972) suggests that organisations which have instituted formal planning procedures do better. Others have suggested the importance of the CEO's full involvement and commitment. The presence or absence of individuals able to undertake the difficult role of "change-masters" in such sensitive situations has also been shown to be important (Mace and Montgomery, 1969) and people issues generally appear to be highly important.

A key problem identified is how businesses can structure their organisations appropriately to meet new problems entailed in managing increased diversity. Certainly there is evidence of a transformation in structure, as businesses broadly have moved towards divisional forms of organisation in Chandler (1962), Channon (1973), Dyas and Thanheiser (1976), and Rumelt (1974), but only the latter demonstrates the link with improved competitiveness in terms of financial performance.

There is a tendency to overstate the strategic significance of the issue. The term "strategy" is used almost as a misnomer for a particular strategy, diversification, despite acknowledgement in the most recent study on "strategy and structure" that by far the majority of companies examined over the last decade had undergone no

diversification at all (Luffman and Reed, 1984).

Dyas and Thanheiser (1976) introduce their study by claiming that perhaps the key strategic problem facing modern businesses is how to manage diversity. Whilst Europe remained awestruck in the 1960's in the face of "the American Challenge" it was natural to focus on US companies' sophisticated systems for managing highly developed and complex corporations. In the context of conducive growth conditions, handling associated organisational problems seemed indeed a key issue if Europe was to catch up with the competitiveness of US companies. In the last decade however competition from US business has diminished and attention has instead focused on Japanese competitors pursuing different managerial approaches. The ability to manage diversity (the issue still stressed in Luffman and Reed, 1984). does not seem to be the key determinant of Japanese competitive success.

Here subtler organisational issues seem to be involved. These may be less amenable to research techniques involving such large numbers of companies. Structural issues such as divisionalisation are relatively easy to establish as they are usually evident from company annual reports; subtler organisational issues often call for treatment in considerable depth (for example Pettigrew, 1985) and would seem at least to require direct company access.

Since the inception of literature on management, organisational issues have been a central area of interest. Their importance has increased as the activities of modern organisations have become more diverse. More recent

literature on strategy, whether in respect to its formulation or implementation, gives greater recognition to the influence of organisational factors (Johnson and Scholes, 1983).

As businesses further evolved, expanding their operations internationally, additional organisational problems were created and, as in the case of diversity, this led to structural and organisational adaptions (Stopford, 1968). However it is increasingly recognised that many issues necessarily shape the choice of appropriate structure and organisation, calling for a "contingency approach".

Yet the key problem, from the viewpoint of competitiveness, seems to be how organisations can adapt to the increased number, and speed, of changes necessitated by their competitive environment, an issue dating back to Burns and Stalker's classic study (1966). Competitiveness ultimately stems from a system's performance along so many dimensions. The problem as Saunders (1984) argues is obtaining greater organisational commitment for making the necessary changes. The final reason for differences in performance is the accumulation of slightly better performance in a host of specific areas, rather than any single "big issue". Saunders believes that it is their unique approach to this problem of organisational commitment to change that has underlain the increased competitiveness of Japanese manufacturers.

2.39 The need for an integrated contextual approach

Faced with such a multidimensional problem and so many possible approaches, those concerned to ensure

competitiveness at the level of the firm have little choice other than to employ an integrated contextual approach. This has been recognised in the classic approaches to strategy that have emerged in recent years following writers such as Drucker (1955), and is best expressed in the concept of ensuring satisfactory "match" between an organisation's internal policy areas and changing threats and opportunities presented the external environment (Ansoff, 1968; Andrews, 1971; Argenti, 1976a, 1979, 1980; McCarthy, Minichiello and Curran, 1979; Glueck, 1980; Johnson and Scholes, 1983).

Such approaches also recognise the influence of an organisation's distinctive goals and the values of people involved. Recent literature has given greater attention to the need to understand the cultural context in which decisions affecting competitiveness take place, and the process by which strategy is formulated (Miles and Snow, 1978). Without this balance earlier approaches tend to present a highly rational basis of analysis, but one which is a little out of touch with the way in which decisions affecting competitiveness actually take place (Johnson and Scholes, 1983; Johnson, 1984).

The final purpose is to isolate key issues requiring attention if competitiveness is to be safeguarded, so that people involved at least recognise the difficult choices or trade-offs they are making. However this should not be a passive, bureaucratised process of analysis, culminating in over-general and inconclusive findings. Rather the purpose is to sharply remind all concerned of key changes that must be made to happen if competitiveness (which is ultimately

the difference between prosperity and a survival crisis) is to be assured. This requires an attitude of commitment, recalling the almost militaristic analysis of writers such as Ohmae. The aim is not passive, it is to transform the prevailing culture.

The strategic issues raised by the need to sustain an organisation's competitiveness cannot, therefore, be treated as an isolated analytical problem. Rather they are now recognised as constituting a much wider problem of "strategic management" (Houlden, 1985). Nor finally can it be divorced from the crucial problem of implementation. Performance is likely to be better improved by simple unsophisticated plans, even if only 80% right; where the ability or commitment to implement them is lacking even the best strategic plans contribute nothing.

2.4 Literature on the vehicle and vehicle components industries

Central Policy Review Staff (1975) incisively summarises many key competitive issues then facing UK vehicle manufacturers: poor distribution networks, inadequate products on offer, poor quality, late delivery, lack of capital investment, poor labour relations and excessive manufacturing costs. Dunnett (1980) indicates the impact of political and economic factors such as stop-go policies, sharply varying taxation and hire purchase arrangements.

As the impact of international competition increases, volume also appears to be a problem for UK manufacturers. OECD's "Long Term Outlook for the World Automobile Industry" (1983) argues that competition in the vehicle industry has become more international for three main reasons: the development of the EEC, the impact of Japanese exports, and the advantageous cost position of newly developed countries. Vehicle industries in Europe, the USA and Japan have all, it is claimed, become steadily more concentrated as manufacturers have pursued scale economies even at some cost in flexibility; the same process is expected to continue on a worldwide basis.

This important argument calls for careful analysis. In respect to Europe, which represents the largest world market, Marfels (1983) finds little evidence of increased concentration between 1970 and 1979; but the industry did anticipate that increased US and Japanese competition would result in further concentration and rationalisation in the

1980's.

Altshuler et al (1984) offer a radically different interpretation of worldwide developments to that of the OECD. This report on behalf of MIT's International Automobile Programme sees little evidence of production moving to low cost countries. Advantages of volume production are said to have been eroded; instead both market changes and technological changes recently have placed a premium on flexibility. World car developments, intended to exploit the advantages of volume and internationalisation, are not viewed as having been successful. The team also refute earlier suggestions that a process of "maturity" was taking place in the industry. See also Jones (1981), and Jones (1983a, p220) for a tabularised summary of the two contrasting scenarios. MIT's scenario offers a more attractive outlook for medium sized producers such as BL, at least from the point of view of volume.

The underlying pattern of competition within the industry is argued to have undergone a number of transformations. Each stage has been associated with a change in the competitive balance. A Schumpeterian view is taken, with the pattern of competition seen as propelled by an adjustment process, with those behind trying to restore the balance. Political interference has however often proved important (within limits) in this adjustment process.

Japan's competitive lead today is viewed as the result of a transformation as revolutionary as the one which gave the USA its original domination over the industry. Not only is it suggested, therefore, that the Japanese lead best practice in respect to specific issues such as quality, but

that the whole approach to management in Japan also represents a step forward in managerial best practice. The suggestion that this has been the result of reversing several managerial assumptions, however, raises crucial questions in the area of competitiveness.

> "... this new system utilizes several key concepts that turn old ideas about production organization upside down. The notion that quality costs more has been reversed. Defect prevention turns out to cost less. Similarly the traditional assumption that large inventory buffers are needed for high process yield has been turned around. High yield, defined as a large number of good parts per unit of operating time, seems most likely to be obtained with very low buffers. Yet another notion that has been reversed is that output can be increased and information about factory conditions can be obtained only through an independent system of supervision and information reporting. Instead of sending manufacturing orders from the top down and bringing information from the bottom up, the Japanese producers have learned that moving knowledge, skills and decision making down the system into the hands of the primary work force makes the old supervision and information-gathering systems redundant. Between the assemblers and suppliers the Japanese have also pioneered new techniques. The old ideas that financial integration, top-down decision making with tight control of product information, multiple sourcing, and geographic dispersion are the keys to production efficiency have given way to operational coordination combined with financial disaggregation, increased single sourcing, and geographic concentration."
> (Altshuler et al, 1984, pp146-147)

Despite high volumes on some models, Japanese competitive strength has generally relied less on a crude volume approach and more on subtler issues such as the flexibility yielded by their alternative approach. The Japanese vehicle industry resisted concentration, which might have improved volumes, and also world car approaches. Their system can handle increasing product variety and more frequent model changes. Such flexibility and their strength in small cars enabled them to take advantage of the second

oil price increase in 1979 to gain considerable market share in America; it also assisted rapid progress into the European market between 1979 and 1980, before they were held back by restrictions. The critical problem for the UK industry then becomes one of bridging the gap with "best practice" established by Japanese manufacturers; undue volume orientation could even prove to be a mistake.

Bhaskar, as well as examining the world situation, has focused on issues facing the UK and European industry. In some senses Bhaskar (1984) could be construed as having become more optimistic from a UK viewpoint. He also recognises the increased importance of issues such as flexibility (both in respect to the market and technology) and he has moved away from earlier world car scenarios (Bhaskar, 1980). Many UK problems identified by CPRS (1975) have been tackled, the main ones remaining being poor quality and excessive manufacturing costs (resulting from the high exchange rate). Bhaskar recognises that the Japanese lead reflects a superior approach to management, but cites Jaguar as showing how UK managers elsewhere could respond:

> "To defeat the Japanese, management may well have to break with a tradition which has been central over 50 to 60 years. An example which illustrates this concerns the decision to invest in products without financial justification alone. One of these qualities is entrepreneurship, and although it is a very old concept it seems to have been ignored by the motor industry recently."
> (Bhaskar, 1984, p11)

Yet there is no margin for complacency. Despite revival in 1984, such a rosy picture "obscures the smouldering fuse of a time bomb". Like the MIT team, Bhaskar sees this threat as Japan. He also sees government as needing to play a major role in any adjustment process,

but here he points to signs of both US and European governments being "lulled into a false sense of security". The issue of flexibility has not entirely dispensed with the problem of volume. Although the UK MIT team representative (Jones, 1985a) has projected a much more optimistic future (based on "dematurity" scenarios) for medium sized volume producers such as BL, Bhaskar (1984) already sees problems for European manufacturers strapped of cash, volume and ploughback. Despite "optimistic noises" he sees some evidence of a vicious spiral of decline.

Early academic research into the UK supplier industry itself was largely descriptive and often included in studies concerned primarily with the assembler sector (Rhys, 1972; Redden, 1975; Bhaskar, 1979). A number of Monopolies Commission reports highlighted the competitive situation in particular UK component markets. The general picture arising from these and industry commentaries suggested a healthier competitive situation internationally than for the assembly sector.

Methodologically, the Price Commission (1979), supported by overseas research in Germany, Japan and the USA and more briefly in Sweden and Italy, set new standards, though many results remained confidential; but the main focus was on the consumer interest in the aftermarket, also covering distribution. The report at that time found profitability to be reasonable, though not excessive and plant and equipment reasonably comparable to that of overseas rivals. In the context of increasing internationalisation, it noted that UK automotive component

manufacturers' working methods were relatively inefficient, due particularly to industrial relations problems. This was leading to "a gradual transference of work overseas" (ibid, sections 6.18, 5.55 and 5.56).

Volume was also a particular problem for UK suppliers: plagued by low volumes and poor and unreliable order sizes, they had little incentive to invest and progress was stagnating (ibid, section 5.7). However, citing an extensive survey by Motoring Which? (April 1978) they found no evidence of UK component prices being internationally uncompetitive: "Spare parts for British cars are generally quite a bit cheaper than those for foreign ones" (ibid, section 7.31). To improve volume prospects, particularly in the future,it was important to allow UK suppliers access to the aftermarket associated with foreign cars. Their recommendation, to therefore disallow franchising agreements, has now been implemented.

Though suggesting volume problems might also be offset by further exports, the report noted the crucial interdependence of UK assemblers and suppliers. The importance of close linkages between the two sectors has been particularly noted in the case of Japan (Anderson, 1981; Shimokawa, 1982 a and b; Jones, 1983a). The Commission was concerned about potential damage to UK suppliers' long term competitive situation should their negotiating position not remain on an equal footing with UK assemblers (ibid, paragraph 97, p12).

More recently, the competitive implications of the MIT team's findings for UK suppliers have been highlighted by their UK representative (Jones, 1983a). Concepts such as

"dematurity" are extended to the supplier sector, in a manner also supported by Bannock (1983), and provide a more optimisitic outlook.

Jones' recent component study (Bessant et al, 1984), though limited to Austin Rover's West Midlands suppliers, has produced highly significant conclusions:

> "The decline in UK production plus the lack of competitiveness were also the principal reasons for a drastic restructuring of the components industry"
> (Bessant et al, 1984, p80)

The report indicates moves towards greater concentration and rationalisation, but the key changes are seen as a move to a "radically different management style", and the need for closer customer involvement, particularly in the context of just-in-time. There is also concern about the way in which the pattern of competition is developing:

> "The continuing effects of overcapacity and price war have meant that it is not necessarily the best firms which survive"
> (Bessant et al, 1984, p49)

Like Altshuler et al (1984) the report believes technological and market changes have reduced critical production levels necessary for scale economies for vehicle assemblers, and it believes this has substantially enhanced BL's survival prospects. Projections for future Austin Rover production levels (Bessant et al, 1984, p23) seem somewhat overoptimistic, but the report warns that a unique opportunity could be missed by suppliers:

> "If they cannot achieve the necessary production increases then we foresee almost all of the gains from ARG's increased volume being lost to foreign supliers"
> (Bessant et al, 1984, p81)

In fact suppliers have little margin for complacency. These projections are based on overseas sourcing at Austin

Rover increasing from 15% in 1983 to 25% in 1986. Austin Rover, having completed its own restructuring over the last six years, now requires the supplier sector to do the same. More recently, Jones (1985b) warns that suppliers' markets are being damaged by a sharp increase in "tied component imports" by multinational assemblers.

If Jones' scenario for BL does prove overoptimistic this only adds weight to his expressed concern that the competitive gap identified in the supplier sector represents a major problem. The report calls for further research into the supplier sector and suggests:

> "It would be necessary in addition to proceed on a product by product basis based on good research into the current and future prospects of each product group" (ibid.)

3. Methodology

3.1 Conceptual approach

Research from particular disciplines, such as marketing, has contributed to an understanding of the problem of UK competitiveness (eg Doyle, Saunders and Wong, 1985). Such studies are characterised by rigorous methodologies. Hypotheses, being well grounded in an established literature, can be carefully formulated and tested along fairly scientific lines and in a manner giving confidence as to the general applicability of research findings.

However, because competitiveness is a multidimensional issue, I have chosen instead a multidisciplinary approach. I have aimed at a more rounded understanding of the situation in a particular industry, making use of case studies to add a greater depth of understanding.

Taken in its multidimensional sense, there is no comprehensive theory of competitiveness. The key factors involved vary from one industry to another. My research emphasis has therefore been less concerned with the "verification of theory": like Glaser and Strauss (1967, p233), I found it necessary to pursue a "grounded approach", guided as much by substantive issues as by more general theory. As they have argued, the criterion of methodological rigour then depends more heavily "on the detailed elements in the actual strategies used for collecting, coding, analysing and presenting data" (ibid, p224).

3.2 Approach Adopted

The competitive situation facing UK automotive component manufacturers can only be understood in the context of the business environment to which they are exposed. I therefore analysed developments in the upstream vehicle assembly industry by reviewing academic and trade literature and other published sources such as official statistics. In addition I approached a number of vehicle companies (one in the UK, one in Germany, and five in Japan) to examine more closely issues of concern to the component sector.

Because of the scale and complexity of the UK automotive component industry, I chose a small number of product sectors for close examination. This raises more practical problems than taking a purely company based approach because companies such as GKN are engaged in a number of product activities. However, to address the issue of competitiveness it was essential to focus on situations in which manufacturers were directly competing against each other, so that "winners" and "losers" in the competitive game could really be distinguished. Also apart from the question of what one UK component manufacturer needs to do to outperform another, an important issue addressed by this study is what can be done to improve their collective performance. Comparisons with international competitors are more illuminating between manufacturers of the same products, actually in direct competition with each other.

3.3 Choice of Product Sectors

Product characteristics likely to affect the pattern of competition were derived partly from the academic literature and partly from an overview of the automotive components industry. Literature on business competition suggested different patterns of competition might be expected in cases of high versus low technology, of new versus mature products, of monopolistic versus fragmented industries. The impact of international competition might also be expected to depend on product related characteristics such as opportunities provided by technology or scale economies, or logistical considerations. An overview of the industry suggested an important distinction between original equipment and aftermarkets and also (Redden, 1975) indicated that a substantial proportion of automotive component manufacturers supplied only about 30% of their components to the automotive market.

The small number of product sectors examined in detail clearly could not be representative in any statistical sense but, as shown in Table 11, they were chosen to cover many of the range of characteristics expected to affect the pattern of competition.

Table 11 Characteristics of automotive product sectors chosen for close examination

Characteristics	ball and roller bearings	forgings	electronic instrumentation	exhaust systems	spark plugs	brake linings
Automotive dependance	only 30%	quite high	very high	very high	very high	very high
Expected radius of competition	very high	fairly low	medium	very low	very high	fairly high
Main market	original equipment	original equipment	original equipment	after-market	after-market	after-market
Pattern of competition	oligopolistic	fragmented	fairly monopolistic but new entrants	oligopolistic OE but AM more fragmented	fairly monopolistic	fairly oligopolistic
Technology	medium	fairly low	high	low	medium	medium
Importance of scale economies	quite high	fairly low	high	low	quite high	quite high

3.4 Examination of Product Sectors

Individual product sectors chosen were first reviewed through desk research - market research and trade association reports where available, press and trade journal articles, official reports (eg the Monopolies Commission, the EEC and NEDO) and official statistics (eg Census of Production and trade statistics). Manufacturers were identified through national and international trade directories. Their annual reports were analysed and additional desk research was undertaken in the case of key manufacturers. The main perspective was on the period from

the early 1970's, when UK vehicle production was at its peak, but some further historical context was built up where possible. Where, as in automotive bearings and automotive forgings, the automotive industry represented one of a number of markets, additional research was carried out into the component sector more generally.

I then carried out interviews with selected UK and overseas automotive component manufacturers, between 1981 and the first half of 1983. The purpose was to get an overall picture of the pattern of competition. Where only a small number of key UK competitors were involved, as in automotive ball and roller bearings, the aim was to visit as many as would allow access. Where large numbers were involved, as in automotive forgings, all major companies were approached, together with a selection of smaller companies covering the range of sizes. Overseas manufacturers approached included major competitors identified together with a wider selection drawn from international trade directories.

Because of the possible commercial sensitivity of competitive issues, companies were first approached at Chief Executive level and offered a veto, if necessary, prior to publication on any sensitive material contributed in the course of visits or interviews.

A structured interview approach was used. Companies varied considerably in their situations and issues discussed were rarely amenable to simple answers. A flexible approach was employed, using many "open" questions in order to allow companies to focus on what they saw as their key competitive problems. A typical questionnaire used as a starting point

for such discussions is shown as Appendix A.1.

The pattern of these interviews varied, but generally included some discussion with either the Chief Executive or some senior company representative. I was then directed to appropriate company personnel to pursue questions on specific topic areas - typically executives involved in planning, marketing, product development and production. In most cases I was able to tour the factory to gain a fuller appreciation of technical and manufacturing developments. Where access was particularly good, repeat visits were carried out to add further depth to discussions.

To gain further understanding of the competitive situation facing UK component manufacturers, overseas manufacturers were also visited in Germany, Japan and the USA. Germany is the most significant competitor in terms of direct trade in automotive components. Indirect competition (via vehicle manufacturers) is also important. Since components represent some 70% of the manufacturing costs of Japanese cars, the competitive impact of their component industry on UK component manufacturers has (to date) been more indirect than direct. Similarly, US component manufacturers were visited because of the competitive significance of the US automotive industry.

Overseas interviews were carried out to complement the analysis of competitive situations affecting UK component manufacturers. In addition emphasis was placed on four main comparative themes:

a) comparison of productivity levels;

b) comparison of manufacturing developments underlying

differences in production performance levels;

c) comparison of senior executives, production management and engineers, in terms of education, training and previous experience;

d) comparison of approaches to longer term planning and strategy formulation at senior executive level.

A typical questionnaire used as a basis for structured interviews with overseas manufacturers is shown in Appendix A.2.

Despite the potential problem of confidentiality, access to companies was generally good as is shown in Table 12:

Table 12 Number of companies accessed

	UK	Germany	Japan	USA
Automotive ball and roller bearings	7	2	3	2
Automotive forgings	11	1	3	1
Automotive instrumentation	2	-	2	-
Automotive exhaust systems	8	-	1	1
Automotive spark plugs	1	-	1	1
Automotive brake linings	1	2	2	-
Other automotive components	-	2	1	-
Vehicle customers	1	1	5	-

The automotive ball and roller bearings sector was given particular emphasis. Since product characteristics were conducive to international trade and competition,

competitive developments in that sector were felt likely to indicate future developments in less internationally developed sectors. Access was achieved to all seven automotive ball and roller bearings manufacturers in the UK and to most of the major overseas manufacturers.

With over one hundred forging manufacturers in the UK alone it was impractical to visit all manufacturers. Three of the four largest companies were visited, including GKN Forgings which accounts for over 60% of UK automotive forgings production. A further cross section of manufacturers was also visited to reflect the situation across the size range down to much smaller companies.

Both of the two independent UK automotive instrumentation companies were visited. They have since combined their operations.

In the automotive exhaust system sector, which is fairly fragmented, the largest UK manufacturer and six others (across the size range) were visited.

Briefer studies were also carried out in two other sectors. The largest independent manufacturers of automotive spark plugs were visited in the UK, the USA and Japan. In brake linings, access was only achieved in the case of one out of the three major UK manufacturers but useful comparisons were drawn from visits to manufacturers in Germany and Japan. A small number of overseas visits was made to manufacturers of other automotive components, principally axles, brake assemblies, and wheels.

Interviews were also carried out with representatives from trade associations, consulting companies, specialist

research centres and relevant government departments, and with academic researchers, both in the UK and overseas.

3.5 Checking for generality

Initial research overviewing the automotive components industry was later extended in order to check whether research themes emerging from the product sectors examined applied more generally. Some themes, such as the strategic importance of developments taking place in the area of production, are inherently difficult to check at an aggregated level. It was however possible to review other relatively well documented automotive product sectors, such as engines and tyres. I also made use of a small number of visits to miscellaneous automotive component companies.

The pattern of company performances across the industry more generally was analysed by aggregating performance figures published by Inter Company Comparisons: for strategic assessment, data is needed over a reasonable time period and I was able to use continuous data over 7 years for 66 companies and over 12 years for 24 companies.

For all products for which data was available, Census of Production data over many years was analysed in conjunction with trade figures, so as to complete market analysis as far as possible. This data enabled me to examine the industry's collective international performance.

Finally, another theme emerging from the study was the importance to this industry's competitive situation of UK economic choices more generally (particularly in respect to pressure on real wage levels). To examine this issue I again made use of aggregated data.

4. The Vehicle Industry

4.1 Introduction

This section reviews upstream developments in the vehicle industry in greater detail, to give an appreciation of the competitive environment to which UK component manufacturers are exposed.

Since OE components represent about 60% of most European vehicle assemblers' costs (Knibb, 1983, p121), the competitive fortunes of UK assemblers and their suppliers would appear highly interdependent, as highlighted in section 2.4. The competitiveness of the component industry is critically dependent on the strength of its home market base; yet any erosion in the competitive position of UK vehicle assemblers is likely to reflect fundamental weaknesses within the supplier sector, in addition to more obvious knock-on effects. Conversely, any sustained improvement in the competitiveness of UK vehicle assemblers is likely to depend on whether any such weaknesses in the supplier industry are satisfactorily rectified.

Section 2.4 indicated two competing scenarios. One emphasises an international process of concentration and rationalisation (linked particularly to the problem of volume); the other emphasises subtler issues and argues for a radically different scenario. Their implications are quite different both for the future outlook of the UK component industry and for its relationships with UK vehicle assemblers. Arguments will be reviewed in a historical perspective.

4.2 Historical perspective

At the turn of the century Europe was still pre-eminent. In 1906 France and Germany accounted for 58% of worldwide vehicle production (Altshuler et al, 1984, p14). Its position also being strong, Britain strongly advocated free trade and maintained no tariffs on auto imports until World War I.

An almost revolutionary change then took place in the pattern of competition, transferring the competitive lead to US manufacturers. Ford's Model T marked radical changes both in production methods (with the introduction of continuous assembly) and also in the approach to management and organisation. Between 1910 and 1921 Ford fully exploited experience benefits associated with volume, by modernising plants, vertically integrating to reduce purchasing costs, eliminating model changes and by increasing the division of labour. Costs were cut by three quarters as US market share increased from 10 to 55% (Abernathy and Wayne, 1974). This more "scientific" approach to management, based on the division of manufacturing skills and routinisation of complex tasks, was further developed during the early 1920's by Alfred Sloan at General Motors. The US competitive lead, encouraged by a substantial home market, continued until almost 1955. The development of competition over this period was dominated by adjustments taking place in other countries as they sought to deal with this competitive gap. American domination in car production over this period is demonstrated in Table 13.

Table 13 Car production 1929-1955 ('000 units)

Year	1929	1938	1950	1955
World	5,355	3,074	8,168	11,015
N America	4,791	2,143	6,950	8,295
W Europe	554	879	1,110	2,486
Japan	-	-	2	20
UK		341	523	898
N America/world %	89	70	85	75
W Europe/world %	10	29	14	23
UK/W Europe %		39	47	36

Source: SMMT Yearbooks

The US also led in commercial vehicles, but the UK position here was stronger. In 1955 the US produced 1,250,000 commercial vehicles compared to 340,000 in the UK and only 49,000 in Japan.

Faced with so large a competitive gap all major European countries and also Japan responded with high tariffs and other protective measures. Even Britain sustained a 33.3% tariff (originally introduced as a wartime measure in World War I) up until 1960. In addition, it introduced a horsepower tax disadvantageous to the US and steep tariffs were extended to tyres and other components.

Both Ford and General Motors responded by establishing manufacturing operations in Britain and Germany between 1925 and 1934; but stronger protectionism in Japan went further and prevented such moves. The US presence in Europe spurred efforts to bridge the gap with world "best practice", both as regards new technology and new managerial approaches. US multinationals were also an important influence in the supplier sector, for example Champion (spark plugs), Timken (tapered roller bearings), Borg Warner (gearboxes), and Cummins (engines).

Since the introduction of Ford's Model T volume has been an important factor shaping competition. Specialist manufacturers of highly differentiated products (eg Morgan, Lotus and, on a larger scale, Mercedes) have been less affected than "volume producers" who represent the bulk of the market. However even volume producers have always had to balance the pursuit of scale economies associated with volume against the need to preserve flexibility, both in terms of marketing and manufacturing policies. In 1927 the insensitivity of Ford's extreme volume orientated approach to a changed pattern of market demand led to a one year close-down as the company was finally forced into retooling for a completely new model, and a total reversal in the market share position against General Motors (Abernathy and Wayne, 1974).

Nevertheless, rationalisation and concentration have generally been driven by the search for scale economies, even perhaps at a cost to flexibility. OECD (1983, p11) points out that the number of US automakers fell from 80 in 1920 to 30 in 1930 and about 9 in 1950 (today the top 3 produce 95% of US cars), and they argue that a similar process of concentration has taken place in Europe and Japan.

Heterogeneous markets within Europe appear to have frustrated the achievement of scale economies comparable to the USA, despite progress in other respects. The competitive gap just before World War II was still evident: even Ford's modern facility at Dagenham had higher delivery costs in Europe than vehicles brought in from Detroit despite shipping rates and higher US wages (Altshuler et al,

1984, p18).

However by 1955 the European vehicle industry had virtually recovered from the effects of war. During the next 15 years its share of world output rose substantially whilst the American position waned, as shown in Table 14.

Table 14 Car production 1955-1970 ('000 vehicles)

Year	1955	1960	1965	1970
World	11,015	12,985	19,281	22,755
N America	8,295	7,001	10,016	7,491
W Europe	2,486	5,120	7,519	10,379
Japan	20	165	696	3,179
UK	898	1,353	1,722	1,641
N America/world %	75	54	52	33
W Europe/world %	23	39	39	46
Japan/world %	0.2	1	4	14
UK/W Europe %	36	26	23	16

Source: SMMT Yearbooks

Europe's fast growing markets were still protected by high external tariffs until about 1960. Even then manufacturers in America took little interest in European markets, which were distinctive in terms of consumer tastes (particularly in respect to size) and still relatively heterogeneous.

Intra-European trade grew rapidly, encouraged by falling internal tariff barriers. This enabled manufacturers to sell their more specialised products in all the markets of Europe in sufficient quantities to realise reasonably good production economies. As its volume situation improved, the European industry also gained in competitive strength because of its flexibility. Manufacturers, still more numerous than in America, competed vigorously in the face of a wide range of design

requirements. Though partially offsetting improvements in terms of volume, this generated equally wide ranging and often highly innovative technical solutions, such as front wheel drive. Following GATT, technological innovativeness and overall flexibility not only enabled European manufacturers to defend their own fast growing markets, but it also enabled them to counter-attack US competitors' own markets in some limited market segments. Later, in the wake of the oil crisis, flexibility (as well as a focus on smaller vehicles) was to prove even more important.

Britain, partly because of its isolated position in Europe and partly through problems of its own making, did not fully participate in the resurgence of European competitiveness. Its share of Western European vehicle output fell steadily from 36% in 1955 to 16% in 1970, as was shown in Table 14.

4.3 The rise of Japan

Though the competitive gap against the US had been bridged, Europe's resurgence was more due to its ability to defend its own fast growing markets, than to any competitive supremacy capable of dominating rivals elsewhere. Yet Japan's almost exponential rise in vehicle output, already evident in Table 14, reflected a transformation in the competitive situation as significant as that instigated by US manufacturers earlier in the century (Altshuler et al, 1984).

As Shimokawa (1981, p274) argues, "both macro and micro factors have increased international competitiveness in the

Japanese auto industry". Without commitment at government level to the protection and development of this industry, Japanese manufacturers could never have survived Western competition at any time up until the late 1950's. They were behind on technology and beset with industrial relations problems affecting both quality and efficiency. The government fostered the industry's development through assistance on licensing overseas know-how and through the provision of scarce financial resources (McArdle et al, 1985, pp47-48). Their system of industrial and conglomerate groups, in turn supported by the banking system, also helped directly. MITI attempted, at an early stage, to rationalise vehicle assemblers by reducing their numbers and also to encourage the development of an independent supplier sector. Both attempts were aimed at benefits from volume more comparable to those of Western competitors; but both failed. The main contribution made by Japan's unique industrial system was that it actually succeeded in fostering virile domestic competition, whilst at the same time providing a system of close collaborative relationships between businesses, and particularly assemblers and suppliers (Shimokawa, 1981). Japanese economic choices, such as their high savings ratio, allowing low interest rates and low exchange rates have also produced a conducive climate for business growth.

At the micro level, following the break-up of the intense Nissan strike in 1955, the Japanese modelled a unique labour relations approach, aimed at gaining much greater participation and flexibility on the shopfloor. Lifetime employment and unique payment schemes played an

important role. More fundamentally however they turned upside down conventional organisational approaches based on the division of labour and scientific management. The number of layers of management were drastically reduced (just as Nissan is now doing in the USA, Financial Times 17.2.85, p8) and a new approach was developed with attention focused onto shopfloor work groups.

In this context it was possible to adopt a new manufacturing philosophy, though progress was slow and incremental, taking effect over a matter of 20 years. The approach was characterised by a commitment to securing long term benefits of organisational learning even at the expense of short term problems. As indicated in 2.4, concepts such as "total quality" and just-in-time systems of stockless production (linking in suppliers also) turned established US manufacturing ideas upside down.

The system has yielded levels of quality, productivity, efficiency and flexibility (both in terms of varying orders and in terms of the ability to handle an increasing variety of new products) as yet unmatched elsewhere. By the early 1980's the Japanese cost advantage over US manufacturers in small cars has been estimated at $1,500 (at 215 yen/$; Altshuler et al, 1984).

As international trade barriers fell the impact was felt initially in particular market segments, but became more significant after the oil crisis and as successive generations of products have gradually been introduced. Table 15 shows how the division of world auto production has been affected in more recent years.

Table 15 Car production 1970-1983 ('000 vehicles)

Year	1970	1973	1978	1983
World	22,755	29,609	31,226	29,494
N America	7,491	10,895	10,315	7,750
W Europe	10,379	11,472	11,321	11,116
Japan	3,179	4,470	5,748	7,152
UK	1,641	1,747	1,223	1,045
N America/world %	33	37	33	26
W Europe/world %	46	39	36	38
Japan/world %	14	15	18	24
UK/W Europe %	16	15	11	9

Source: SMMT Yearbooks

The Japanese share, just over 1% in 1960, is now virtually on a par with North America (in 1982 it was ahead).

In spite of GATT and free trade rhetoric European governments responded, just as they had had to when faced with the earlier rise in US competitiveness, with measures aimed at some degree of protection. This has helped to stabilise the European position. Restrictions have so far held the Japanese share of the European market to about 11%, whereas some estimate that unfettered this share would rise to about 25% (Marketing 14.3.85, pp30-32). History suggests that although protection can play an important role for a time, it can only stave off an inevitable process of adjustment. There seems to be a recognition, shared by the US government which in 1985 abandoned the "voluntary restraint agreement", that the scope for such measures is perhaps now more limited.

European manufacturers cannot escape Japanese competition either in the now open US market, or in other markets. Since the early 1970's European car exports have

fallen from 3m to 1.3m units. Ford claim Japanese manufacturers alone have eliminated 1.6m European exports as well as taking 1m car sales in the European home market (Financial Times 16.10.84, pI). European overcapacity in 1984 was estimated at 2.3m units or nearly 20% (ibid, pIV), leading to vicious price competition. Many progressive European manufacturers (eg Ford Europe) are pursuing competitive standards set by Japan and finding the lessons applicable to their own European situation. Thus any European country or company which does not rapidly close the competitive gap with Japan faces inescapable competition from other European competitors who are doing so, as well as increasing Japanese competition based within Europe itself (such as Nissan and Honda). As Table 15 shows, the UK vehicle industry's share of Western European production has fallen back to only 9%: its position would seem particularly precarious.

4.4 Globalisation of competition

Most commentators would acknowledge the pressing need for vehicle assemblers (and indeed their suppliers) to bridge the competitive gap with Japan; but whether or not these new developments will lead to further concentration in the world vehicle industry is more contentious. Following the first impact of Japanese competition, many felt the answer to be yes. Moves to smaller, more fuel efficient vehicles seemed to be bringing world markets closer together. General Motors and Ford responded by attempting to exploit benefits associated with internationalisation and volume by developing "world cars" such as GM's "J" car and

Ford's Escort. In addition major international link-ups such as between GM and Toyota seemed to confirm "world car scenarios" of increasing internationalisation and rationalisation. Japanese competition was seen as merely catalytic to this process.

The MIT team however point to a radically different scenario in the wake of the transformation they see as having taken place in the pattern of competition. Improved methods developed by the Japanese now place a premium on flexibility; crude volume orientation may be dangerous, as it proved to be for Ford in 1927.

Europe, the largest market, still displays distinctive preferences and different patterns of segmentation. French customers still prefer their own distinctive styling, and Italians prefer smaller cars suited to their narrow streets, whilst the German market tends to polarise between good quality, fairly practical cars (eg the VW Polo) and more expensive, luxury, high performance cars (eg BMW and Mercedes). National companies still orientate their models primarily to their national markets.

Market segmentation has become even more complex, with differentiation not merely on the basis of size but also along entirely independent dimensions of luxury, utility, economy and performance. "Down-sizing" has compressed model ranges, but intensified competition has led to an increased variety of product offerings, as even volume manufacturers such as VW/Audi, Renault, Fiat and Peugeot have placed greater emphasis on product differentiation. Also, ARMC's forecast to 1987 (Financial Times, 2.8.85, p4) suggests most

of the 500,000 units of additional market demand expected in Europe will go to specialist producers such as Mercedes, BMW, Volvo and Saab, rather than to volume producers. Specialist segments have also become more profitable.

These developments have been supported by much more flexible systems of vehicle manufacture; Bessant et al (1984) argues, for example, that new tooling systems and manufacturing methods (along lines pioneered in Japan) have enabled BL to reduce the critical level for scale economies.

There has been an explosion of technological innovations:

- electronic developments aimed at fuel economy (engine/drive train management systems), safety (anti-skid systems) and product differentiation and convenience (instrumentation)
- use of new materials aimed at weight reduction (plastics) or safety (windscreen materials)
- new concepts in vehicle design

Patenting activity has increased sharply in Japan, the USA and Germany, though Britain appears to lag behind (Jones, 1983a, p227).

The conflicting demands of volume and flexibility have been partly reconciled by an emerging pattern of both competition and cooperation between vehicle assemblers and also component manufacturers, analogous to the pattern of competition which has for many years existed in Japan. Extensive joint ventures, such as between BL and Honda, are already widespread (eg joint engine development by Renault, Peugeot and Volvo) and seem likely to increase. The same pressure is forcing much closer cooperation between

assemblers and their suppliers (eg BL and Perkins on diesel engine development for the Rover V6) and also between component manufacturers themselves.

These factors modify any scenario of increasing concentration (even among volume producers). Altshuler et al (1984, p183) argue that this and the likelihood of, if necessary, protective intervention mean "there are likely to be about as many automakers 20 years from now as today". On this basis prospects for medium volume producers such as BL are much brighter. Similar thinking leads Bessant et al (1984, p23) to expect Austin Rover's output to increase from 360,000 vehicles in 1982 to 575,000 in 1986.

MIT seem to have been correct in debunking more extreme world car scenarios. The Japanese competitive advantage does appear to be based more on flexibility than on volume, as Bhaskar (1984) would also seem to argue. GM and Ford do seem to have misjudged the market in introducing their world cars. For example, the US market moved sharply away from European-type small cars just as the Escort/Lynx and ideas of rationalisiing parts between Europe and America did not work out in practice. Bannock (1983, p38) pointed out that 95% of components for the US version were sourced locally. The most recent Financial Times survey (11.9.85, pX) has summarised the situation: "The first world cars appeared as recently as 1980 but already the concept seems to be as old-fashioned and outdated as a model T Ford".

Yet whilst they are correct in pointing out the dangers of simplistic scenarios and of crude volume orientated strategies, I believe they may have understated the

significance of volume in a broader sense. In consequence, Bessant et al's (1984) conclusions about the prospects for medium sized volume car producers seem to be over-optimistic.

Bhaskar suggests overcapacity in Europe, currently about 2.5m cars p.a., could reach 4m by 1990 if present trends continue (Financial Times 11.9.85, pXII). Pressure for rationalisation will be compounded by investment demanded by the accelerated pace of technical innovation, and the need for new plants and models. Marfels (1983, pxvii) cited the US industry as planning investment of about $75bn. DRI Europe (1985, p15) point out that 1984 was the fifth consecutive year of aggregate losses by European vehicle manufacturers and that an aggregate cash haemorrhage of $2bn p.a. over the same period has left a legacy of balance sheet weaknesses. They see signs of both bankers and governments losing patience (see also Financial Times 11.9.85, pXII). At the same time, "The average expected product sales-life in Europe is still currently 8 years, when Japanese competitors are moving towards 4 years (as for instance Mazda with the 323). GM's replacement of the Kadett after just 5 years has set a new standard in Europe."

Marfels' (1983) survey suggested European vehicle assemblers expected further concentration and rationalisation would result from increased competition from the USA as well as Japan. US manufacturers reported an aggregate surplus of $20bn in 1984 (Financial Times 11.9.85, pI) and their new model programmes are impressive. GM's Saturn, for example, represents a massive $3.5bn investment aimed at overcoming the substantial Japanese cost

advantage. Japanese aggregate profits in 1984 were reported at $4bn (Financial Times 11.9.85, pI). Bhaskar (1984, p12) warns of further improvements in Japanese models' "product characteristic index" comprising factors such as style, performance, comfort and handling, cost and maintenance. Japanese models are also ahead on quality and reliability (ibid, pp301-303).

Some rationalisation is already happening. Knibb (1982) points out that the number of unique vehicle marques in Europe has fallen from 50 in 1972 (cars and commercial vehicles) to 34 in 1982 and projects a further fall to no more than 25 by 1992. In 1978 there were 78 vehicle models with 14 accounting for 85% of the market. By 1990 Knibb estimates the number will fall to no more than 46 with 6 models taking 60% of the market.

Larger multinational assemblers are particularly affected. Poor profitability has forced Peugeot and Renault to retrench. Ford, despite better profitability, has had to cut back its international operations and is now linking with Ford. Even VW has cut back in the USA. Gooding (Financial Times, 3.5.85, p13) suggests the only car assemblers with credible multinational operations in the 1990's will be VW in Europe, GM and Ford in the USA, and Nissan, Toyota, Mitsubishi and Honda in Japan.

VW's chairman, Carl Hahn, argues that European manufacturers cannot afford to draw back into the European market: "We already see the Americans in Europe and the beach-heads of the Japanese in Europe ... this IS the future: one world market for cars where the customer is

pampered by every automobile manufacturer in the world" (Financial Times, 3.5.85, p13).

Hahn does not accept that the emerging networks of collaboration between assemblers (and their component suppliers) will stave off such pressures: "Links for components do not change your core problems. You have to have a sound base". Another plank in MIT's argument is that FMS production methods will enable medium sized volume producers such as BL to obtain production economies, with plant output as low as 240,000 cars p.a.. BL has achieved real progress towards greater flexibility. It has also during the last year cut its "concept to production" time down from 5 to 3.5 years, but as DRI Europe (1985, p17) point out:

> "the leap between current practice and this Utopic future (heralded for instance in the MIT study) and where sixteen passenger car manufacturers could theoretically all operate at competitive production levels by utilising the latest manufacturing technology is a very long one, and probably beyond the ability of many participants to fund".

They conclude:

> "Major changes in the relative share of each volume manufacturer are liable to take place."

Like Bhaskar (1984) DRI also point to further threats from Japan, whose share of world car output they project rising from 24.6% in 1984 to 30% by 1990. Given moves also by US manufacturers, this must have a further catalytic effect on accelerating world rationalisation. Thus, whilst crude volume orientated strategies such as "world car" developments may well be dangerous as MIT indicate, the scenario of further concentration in the world industry cannot be entirely dismissed. On this scenario the

prospects for UK vehicle assemblers such as BL and for their suppliers are likely to hang on a knife edge once the immediate upturn is over.

Table 15 showed that UK vehicle manufacturers' market share even within Western Europe fell from 15% in 1973 to 9% in 1983. Table 16 analyses recent developments in the UK market.

Table 16 UK market shares (%)

		1973 %	1978 %	1983 %
UK produced:	BL	31.9	23.5	15.8
	Ford	22.6	16.1	15.5
	Vauxhall and Talbot	18.7	8.3	1.0
UK assembled:	BL	-	-	2.1
	Vauxhall and Talbot	-	3.7	7.9
Captive imports:	Ford	-	0.6	13.4
	Vauxhall and Talbot	0.3	4.4	10.2
Other imports:	Japanese	5.6	10.9	10.8
	European	20.9	24.5	23.2
UK produced		72.3	47.8	32.4
UK assembled		-	3.8	10.0
Captive imports		0.3	13.0	23.6
Other imports		26.5	35.4	34.0

Source: Bessant et al (1984),p11

UK decline may be traced largely to BL's weak position in the market. The other critical factor is that more powerful companies such as Ford and GM have relied increasingly on "tied imports", implying that even they are finding Britain uncompetitive as a manufacturing location.

Bhaskar (1984, p295), believing that many other problems affecting the UK motor industry have been tackled, is particularly concerned that the UK cost position has been

rendered uncompetitive by economic choices: "Since 1978, monetarism and North Sea Oil have contrived to introduce a new element which completely swamped the competitiveness of the motor industry". Real exchange rate movements have been reflected in much higher UK vehicle cost levels and prices (see for example Ashworth et al, 1982). From such analysis the rise in tied imports is unsurprising. More recently Jones (1985b) has pointed to a new element in this situation, "tied component imports, contributing in 1984 a further 9% effective imports (other imports in total being similar to 1983).

Jones' (1985b) acknowledgement that BL's progress in the marketplace is becoming stymied by intensified competition from GM and Ford suggests the MIT scenario may be underrating the continuing implications of volume. Taken together with the problems of operating from a now less competitive cost base, I would therefore be even more concerned about the UK vehicle outlook, unless the UK responds much more positively to the challenge posed by international competition.

4.5 The relationship between vehicle production and component markets

The sizes of European markets for vehicle parts are shown in Table 17. Figures include parts for tractors and engines as well as for cars and trucks. The UK's share of European trucks, tractors and small/medium engine production in 1980 was 27%, the largest in Europe. This increases UK figures.

Table 17 Sizes of main European markets for original equipment vehicle parts in 1981

Country	Value/£bn	European share/%
Germany	6.3	33
France	3.6	19
UK	3.1	16
Spain	2.1	11
Italy	1.9	10
Rest of Europe	2.1	11
Total	19.1	100

Source: Knibb (1982)

These figures nevertheless indicate that the UK component market is larger than that suggested by vehicle production levels, where the UK share is only 11%. UK producers of both cars and trucks have traditionally bought in to a much greater extent than others in Europe.

Although declining slightly between 1979 and 1981, international trade in parts has been increasing more rapidly than vehicle production. Between 1974 and 1979 original parts imports rose 270% in Germany, 100% in France and 60% in the UK, compared with vehicle volumes up by 37%, 18% and -26% respectively (Knibb, 1982). Trade is expected to increase further as is shown in Table 18.

Table 18 Trade trends in European component markets

	1979	1981	1990 (forecast)
European market, 1981 £bn	21.8	19.1	22.0
Non-Europe trade, %	1	1	2
Inter-European trade, %	10	9	23
Domestic, %	89	90	75

Source: Knibb (1982)

Of the projected market increase between 1981 and 1990 only £1.7bn is expected to derive from rising vehicle

production and £1.2bn is expected to come from greater outsourcing by vehicle manufacturers (Knibb, 1982). Accelerated technical change and a poor funding position are thought likely to increase European assemblers' reliance upon suppliers.

In the past the position of UK suppliers was strong and fairly independent, their technological capabilities having developed to meet the needs of many engineering based industries. As in the USA, supplier/assembler relationships were "arms length", rather on a free market basis. Both assemblers and suppliers were cushioned from competition by UK tariffs up to 1960, and both sectors tended to be complacent about their effect on the other's competitiveness. Suppliers were also cushioned by established and sometimes monopolistic customer relationships.

Dual- and sometimes multi-sourcing were introduced partly to improve security of supply on key components in the early 1970's, and partly for cost reasons. In the mid-70's UK assemblers experienced more intense international competition and had to pass pressure for cost reduction on to suppliers. The later extension of multi-sourcing increased negotiating power, and so reduced costs in the short term, but at the expense of weakening the supplier network. Suppliers were hit by falling production volumes, with the remaining business increasingly split up (further offsetting scale economies) leading to more rivalry among suppliers. After 1979 worldwide recession in the motor industry and growing overcapacity stepped up international

competition just as the cost position of UK assemblers and suppliers was sharply eroded by a soaring exchange rate.

Both BL and Ford conducted detailed international surveys comparing component costs. BL's Chief Executive, Ray Horrocks (CBI/SMMT conference, London, 16.5.83), described how they had "found that, virtually across the board of electrical, mechanical, trim and body components, Japanese produced parts were between ten and thirty five per cent cheaper tlan tle cost of their European equmvanents ... Indeed if sheer commercial logic was to be the sole criterion then a large proportion of our components business would have left the UK at the time". Ford's Chief Executive, Sam Toy also pointed to the fact that UK suppliers were responding inadequately to international standards of competitiveness in three key respects: consistent quality, delivery and price. He acknowledged there had been "some drop in our level of local sourcing" and stated that:

> "Because we are making our vehicles to European quality standards not British ones; we have to survive out there ourselves - and there has been some improvement but there are still too many British suppliers who cannot give us competitive standards of quality. And even when they do they often can't deliver the quantities we need when we need them."

Vehicle companies were prepared for drastic action to ameliorate the competitive gap which had emerged on components. Jones (1985b, p9) summarises the impact on component markets:

> "The volume of UK components supplied to UK car assemblers in 1984 was as a result only 33 per cent of the 1972 level. Between 1972 and 1979 the collapse of the component market was almost entirely due to the fall in the numbers of cars produced in the UK. However, since then imported components accounted for half the drop in the component market. There is little doubt that the UK components industry suffered the biggest collapse of any car producing nation in the

world."

Much of this is due to multinational vehicle assemblers; BL Austin Rover Group's volume adjustments have so far been more competitive. "Currently, ARG is believed to be purchasing between 85 and 90% of its components in the UK" (Bessant et al, 1984, p26). Yet in the context of overcapacity in the component sector, BL's move back to single sourcing, its threat and occasionally use of overseas sources enabled its purchasing department to completely reverse the bargaining positions of the two sectors: "most components have been subject to a four year price freeze and some are even cheaper now than their 1979 prices" (Bessant et al, 1983, p61). The UK general wholesale price index rose just over 46% over this period. Whereas UK component companies averaged about 18% return on capital employed during the 1970's (see section 6.2) over twice that for UK assemblers, for the first time ever they actually averaged losses just as BL's financial performance was beginning to improve.

BL has recognised that such policies weakened the technological capability of its supplier base and led to a deterioration in supplier relations at precisely the moment when it needed greater supplier collaboration and technological support. Yet comparing overseas component prices, Austin Rover estimates that in the four year period after 1979, it effectively subsidised UK suppliers by about £30m p.a. even after its drastic cost reduction programmes, giving it little room for manoeuvre (Bessant et al, 1984, p62). Like other assemblers it is now attempting to move towards a much closer and more collaborative relationship

with suppliers.

To this end both BL and Ford are entering into longer term agreements, though with a smaller number of suppliers. They are demanding high standards of supplier service and involvement, through from quality assurance, technological support, the taking of responsibility for a much more flexible service (inventory costs being made a supplier responsibility) and of course cost reduction. But in return the relationship is gradually becoming more two-way, with assemblers offering longer term assurances and being much more prepared to offer suppliers more detailed information and greater involvement in regard to their own plans. Gains from collaboration (eg on cost reduction) are now being split more equally between the two sides.

Such a relationship has been crucial in Japan to developments which have led to an extremely competitive vehicle industry, such as complete just-in-time systems of manufacture, operating through from assemblers, to suppliers, and to suppliers' suppliers. For UK component manufacturers a closer relationship seems crucial:

> "Given the high degree of national purchasing there is only a small proportion of business to be had in other European countries by direct exports"
> (Jones, 1983a, p233)

UK assemblers and suppliers alike now face a race against time to close the competitive gap which has been allowed to emerge.

5. Competition in Selected Sectors of the Automotive Components Industry

5.1 Automotive ball and roller bearings

5.11 The UK market for bearings*

To understand the situation in automotive bearings it is first useful to examine the UK market for all types of bearings. This is analysed in Table 19.

Table 19 UK ball and roller bearings market by value (£m)

	1970	1974	1978	1980	1982	1983
Sales by UK manufacturers	83.3	116.2	188.4	239.4	193.7	179.4
Less exports	22.1	40.6	80.8	113.4	109.9	104.7
Plus imports(1)	18.4	62.7	115.9	132.1	141.3	146.3
= Home market	80	138	224	258	225	221
Import share	23%	45%	52%	51%	63%	66%
Japan's share	3.2%	6.6%	6.4%	7.1%		
Exports/sales	26%	35%	43%	47%	57%	58%
BofT/home market	+4.5%	-16%	-16%	-7%	-14%	-19%
Adjusted to 1980 prices (£m):						
Sales by UK manufacturers	315	280	243	239	161	142
Less exports	82	98	104	113	92	83
Plus imports	68	151	149	132	118	116
= Home market	302	333	288	258	187	175

1) Import figures have been increased consistently by 35% in line with the trade association correction to raise import prices to market prices.

Source: Business Monitor

Allowing for inflation, the home market by 1983 had fallen to 58% of its level in 1970. Gradual market decline

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* The term "bearings" will be taken to refer to "ball and roller bearings" unless otherwise specified, thus excluding plain bearings.

up to 1980 is understandable given UK vehicle production levels for example nearly halved between 1973 and 1980; but such steep decline after 1980, when UK vehicle production in fact remained stable, would seem to reflect more fundamental problems in the UK, and not merely recession either.

The market comprises direct automotive sales (28%), mechanical engineering (25%), agricultural machinery (8%), aero (6%), other transport industries (5%), and electrical appliances (5%). The remaining 23% is directed through distributors. Of this about 2% is for the automotive aftermarket, so that bearing manufacturers depend on the automotive market for only about 30% of their sales. Potentially, bearing manufacturers might have been expected to have had more scope than other component manufacturers for offsetting automotive decline by increasing other activities. In fact, the market split is considered to have remained fairly stable. The market base has therefore been eroded by comprehensive decline among UK customer industries, allowing little scope in this direction.

The impact of direct international competition has increased substantially. Import penetration increased from 23% in 1970 to 66% in 1983. Although UK manufacturers' export ratio increased from 26% to 58%, export volume actually remained flat.

Thus business competition in this sector is now much more international. Market performance has been damaged both by direct international competition, this being reflected in the declining position on international trade, and indirectly, due to comprehensive decline among UK customer industries, themselves also highly exposed.

5.12 The direction of trade and competition

Table 20 analyses the source of imports and the destination of exports.

Table 20 Source of UK imports and destination of UK exports

	% of UK Imports		% of UK Exports	
	1970	1980	1970	1980
EEC	33	55	22	45
USA	33	16	10	8.5
Japan	11	14	-	-
Germany	26	30	5	14
France	3	10	6	12
Italy	3	11	5	11
Sweden	10	6	3	5

Source: Customs and Excise

US trade has reduced in significance, whilst Japanese competition has become more important. The major focus of both trade and competition is now therefore Europe.

5.13 Competing companies and market performance

In 1969 the three remaining major UK-owned bearing companies merged, with assistance from the Industrial Reorganisation Corporation, to form RHP. Other UK manufacturers of automotive bearings are subsidiaries of overseas companies.

Table 21 gives performance details for the most important world competitors in this sector. Some details for UK subsidiaries are also included to give a better appreciation of the UK situation. These should be treated cautiously as their results reflect parent company marketing operations in addition to UK manufacturing.

Table 21 Sales performances of companies and of UK subsidiaries

Company and base	Units	Sales 1970	Sales 1980	Sales 1983	Growth 1970-80 %pa	Growth 1980-83 %pa	Sales 1983 £m*
SKF (Sweden)	kr/m	4,758	12,512	16,191	0.1	(0.02)	1,390
Timken (USA)	$m	365 (1972)	966	na	2.68	na	560 (1981)
FAG (Germany)	DMm	1,680	1,950	1,710	(3.03)	(7.44)	430
NSK (Japan)	y'000	52.27	167.7	185.6	6.92	2.87	550
Koyo (Japan)	y'000	51.9	110	126.7	1.18	4.34	375
Federal Mogul (USA)	$m	251.1					
Torrington (USA)	$m	Does not publish accounts					
Nachi-Fujikoshi (Japan)	y'000	48.3	91.15	91.48	0.98	(0.05)	270
NTN (Japan)	y'000	45.3	149.1	184.9	7.36	7.23	550
INA (Germany)	DMm	Does not publish accounts					
N Thomson (Japan)	y'000		12.2				
SNR (France)	FFm	Does not publish accounts					
RHP (UK)	£m	40.1	120	102.4	(1.91)	(10.85)	102
SKF UK	£m	22.19	71.78	66.37	(1.25)	(8.97)	66
Torrington UK	£m	6.608	24.1	25.85 (1982)	(0.13)	(0.53)	26
INA UK	£m	4.279 (1971)	11.6	17.22	(2.01)	5.78	17
NSK UK	£m		6.88 (1979)				
Timken UK	£m	Does not publish accounts					

Source: company accounts

*Note: growth rates calculated after adjusting for inflation of domestic currency by means of wholesale price indices. 1983 exchange conversions based on sterling at: $1.4514, 337.0 yen, FF12.1147, 2408.6 lira, DM3.9536, 11.6125 Swedish kronor.

Poor UK sales performances (with the exception of INA recently) reflect the poor domestic market situation already discussed. Although RHP is the UK market leader, it is

considerably smaller than the parent companies of key competitors taking an international perspective. Most are supported with UK and other overseas manufacturing operations: SKF, Timken, Torrington, INA and NSK.

As the radius of competition has become more international RHP, which lacks an overseas manufacturing capacity, has found its competitive position against world competitors increasingly vulnerable. Between 1970 and 1980 total sales volume fell back relative to other competitors, and also in absolute terms, at about 2% per annum. Between 1980 and 1983, as competitive conditions intensified it fell back even more sharply: total sales volume declining at about 11% p.a., despite non-bearing activities increasing to 27% of sales.

Competitor positions in the UK and other major European bearing markets are shown in Table 22, and show the strength and international integration of RHP's main competitors. Furthermore, as will be explained later, most have achieved defensible positions, coherent in international terms. Some indication is given in Table 23.

Such coherence, in international terms, is less evident in the case of FAG, SNR, Nadella and RHP and this tends to be reflected in poorer long term performance. Their competitive positions were undoubtedly stronger and more coherent whilst competition was largely fought on a country by country basis. France's Nadella, in needle bearings, is too weak to survive competition from INA and Torrington and at some stage may well be taken over. FAG is still extremely powerful because of its strong German home market base and because of its highly successful exporting

performance. France's SNR, whilst weaker, is nevertheless supported by its closely tied relationships with French vehicle manufacturers. RHP has a fairly close relationship with BL, but given a small and declining home market its position in international terms has been weak.

Table 22 Competitor positions in European markets: % shares

UK	Germany	France	Italy	Spain
RHP* 22	FAG* ~35	SNR*	SKF* 70	SKF
SKF* 18	SKF* ~35	SKF* ~33	FAG 15	FAG
Timken*14	INA*	INA*		Japan
Japan* 8	Japan*	Timken*		SNR
FAG 5	Timken	SNCF*		
Fafnir 4	SNR	Japan*		
INA* 4	RHP <1	Nadella*		
Others 25				
(Others are principally Torrington* SNR and then a host of specialist mfrs)	In 1968 FAG and SKF held about 40% each but have lost share to INA and Japan.			
Automotive only:				
RHP ~25	Vehicle customers more "open" but competition among mfrs duopolistic	SNR owned by Renault and close links with Peugeot	SKF's plant closely linked with Fiat	SKF has strong position with SEAT (Fiat link) and GM
SKF ~20				
Timken~16				
Torrington				
INA Japan ~2				
RHP link with BL fairly strong				

* denotes market support through manufacturing operations

Table 23 Strategies of major international competitors

SKF	TIMKEN	NSK	TORRINGTON	INA	FAFNIR
World market leader	US market leader	Japan market leader	US leader in needle bearings	European leader in needle bearings	World leader in aero market
Full range except tapered roller bearings	Tapered roller bearings only and world leader in this segment	Full range except tapered roller bearings, but European strategy focused on metric ball bearings, volume ranges such as electrical applications	Focused on particular applications	Similar applications approach to Torrington	Strength in pulley block bearings
Integrated manufac- facilities in all major European markets Manufac- turing support in USA and in some other parts of world	Major base is USA, but operations supported by plants in UK and France	European position supported by modern UK plant dedicated to volume metric	Strength in applications engineering and customer support on more marginal business European position in this niche 2nd to INA but supported with manufacturing facilities in UK and Germany	Supported with manufacturing operations throughout Europe and rest of world US position in this niche 2nd to Torrington but supported by manufacturing operations	
Metric bias	Imperial bias	Metric	Imperial bias	Metric bias	Imperial bias
Diversified (28%) into related steel activities	Diversified (32%) into related steel activities	Diversified (31%)			

5.14 Key issues

5.141 Changing pattern of competition generally

In the late 1950's and early 1960's (prior to Britain's entry into the EEC) British bearing manufacturers remained fairly isolated from European or Japanese competition. Imports were mainly limited to specialist bearing types, mainly from the USA through Timken (tapered roller bearings) and Torrington and some from SKF in Europe. Most of these companies' sales, though, were based on production from their UK factories and competition was on a national basis. Exports to soft Commonwealth markets more than covered any net imports from these companies, and the international competitive position of the sector was strong.

Yet an undercurrent of change was taking place in the pattern of competition. Exports to Commonwealth markets were declining; but in Europe, now their main destination, Britain faced powerful competitors. At the same time the first tremors of Japanese competition signalled a step change in the intensity of competition among the major world bearing companies. This in turn was to lead to international rationalisation in the industry.

The key development involved was a change in manufacturing processes. The Japanese mounted their attack on the European market on a few popular size ranges of radial ball bearings, the main application being electric motors. Given long production runs they moved from batch production, which made use of fairly basic flexible equipment, to a flow line operation employing dedicated equipment. Although raising investment requirements this

resulted in a step change in the productivity both of labour and working capital. Gearing up manufacturing operations accordingly the Japanese aggressively pushed down costs as cumulative production volume rose, in the manner of the "experience curve". (Boston Consulting Group, 1975, estimate the gradient for Japanese radial ball bearings at 73%). Japanese manufacturers were assisted by a fast growing home market, which if not as large as Europe was substantially more homogeneous. Moreover the structure of their industry was less fragmented: in 1977 for example four companies accounted for 90% of total sales and 95% of exports.

The initial British reaction was one of almost amused complacency as the Japanese struggled unsuccessfully to come up to European quality standards. What then surprised many was the degree of commitment with which the Japanese pursued their strategic thrust. To achieve the required quality they broke industry quality/cost trade-off norms, accepting a substantial (in the short term) cost penalty by using extensively expensive operations such as honing. Having finally met quality standards and established a foothold in the market they were gradually able to exploit experience effects to improve cost levels and quality levels still further.

As the Japanese competitive position gradually strengthened British manufacturers, slow to respond, were cushioned for a time by lower capital charges resulting from depreciated equipment. One Japanese executive who had visited British plants recalled how he had envied such low

capital costs at the time, though not with the benefit of hindsight.

The effect on sales volume was fairly small, particularly in the automotive market, starter motor / alternator bearings being a fairly minor market segment. Financially however such long order runs represented "cream" business and multinationals such as SKF were quick to respond with their own manufacturing changes. Manufacturers finding profit margins under greater pressure recognised that similar productivity and cost improvements could be made in other market segments. The name of the game, at least for the more powerful competitors, seemed to be "volume", the means being to standardise onto fewer product ranges. This became a crucial factor driving rationalisation within Europe.

One by one the multinationals reorganised their manufacturing operations in the face of international competition intensifying as companies scrambled for volume order business. No longer content to compete on a country by country basis, SKF between about 1968 and 1975 radically integrated manufacturing operations within Europe to obtain the maximum benefits of volume. Their new "global forecasting supply system" (GFSS) put planning and scheduling on a European basis. Timken reorganised its British and French plants, hitherto fairly autonomous, into Timken Europe and a new chief executive was appointed with a brief to "bring down the walls in Europe".

INA and Torrington, though powerfully supported by overseas manufacturing operations, responded more cautiously. Both stressed applications engineering and the

provision of a more flexible customer service. They have therefore been wary of becoming too orientated towards volume order runs, and have so avoided head-on collision with SKF for example except in their more specialist applications. Nevertheless by the end of 1982 Torrington USA had finalised its plans to coordinate international operations much more closely, mirroring many of the manufacturing changes at SKF (eg commonality of tooling). INA has also become more integrated internationally.

Thus as the radius of competition became more international in volume segments, companies have generally had to adjust their strategies. The choice has been to orientate operations more internationally, reorganising where necessary to secure maximum volume benefits, or to develop roles still coherent internationally but avoiding head on competition with powerful international competitors.

5.142 Response to automotive developments

Ford and GM have moved to centralised purchasing within Europe and multinational bearing companies such as SKF and INA have adapted their operations to provide better support internationally. This has meant ensuring commonality of design and quality standards so that no matter where Ford is assembling or where SKF is manufacturing, bearings will fit and function properly: a left hand bearing made in one country may also have to match a right hand bearing made in another. Commonality is particularly important in the context of an increasing number of international joint ventures among customers, for example gearboxes which

incorporate bearings. An effect has been to raise minimum acceptable quality standards in all manufacturing countries to common norms, these being above those acceptable in Britain in the past.

SKF now sets price levels against local market conditions (UK price levels were about 12% higher than elsewhere in Europe in 1981 due to exchange rate movements). In the short term this involves riding cost variations between different countries and affords some cushioning to countries such as the UK which have allowed relative cost levels to rise. Having rationalised manufacturing operations internationally, they want to minimise disruption. However, in decisions with longer term implications such as major investments or closures, they are now much more sensitive to the issue of cost competitiveness (as indeed are all their customers). SKF has reorganised formally to mirror increasing integration in the world vehicle industries, and sees further changes in the future. This is illustrated by organisational charts in Appendix B.1.

Vehicle customers are requiring increased technical support and this has been reflected in component company strategies. Timken has stepped up R & D considerably. SKF's move, up-value-added, into integrated wheel hub bearings represented an investment of about $25m, a step change well beyond levels affordable by Britain's RHP and recoverable only in the context of a more international market. Similarly, INA is placing still greater emphasis on applications engineering such as its successful clutch release bearing, an innovation saving Ford substantial

warranty costs.

The bargaining position of vehicle customers has increased, forcing these suppliers to reduce margins in real terms, whilst reflecting customers' needs much more closely. For example the cost of stockholding, as a buffer against varying vehicle production levels, has been passed back to suppliers. Given fewer major vehicle purchasing departments, and their wish to deal with a smaller number of suppliers, there is pressure to squeeze out marginal international competitors. In such a capital intensive industry this competitive pressure is of course increased by overcapacity. Intensified competition has raised the cost of complacency: for manufacturers not responding adequately to new developments now face not merely suboptimal profit levels, but the threat of closures and asset write-offs.

Thus customer demands have forced a more international pattern of direct competition, both because in many cases they required international support from component manufacturers, and because they were increasingly able to insist on international standards of service and performance.

5.143 Productivity

Some indication on productivity is given in Table 24.

Table 24 Company productivity performances

Company	Employees			Productivity Growth			Sales/ Employee
	1970*	1980*	1983	70-80 %pa	80-83* %pa	70-83 %pa	1983/£*
SKF	67375	56501	45683	2.04	5.33	3.05	30,400
Timken	22433	22874		3.04			29,100
NSK		7006	7363		1.11		74,800
Koyo		5487	5510		4.19		68,200
Nachi-Fujikoshi		5000	5032		(0.71)		53,900
NTN		3981	5949		(15.56)		92,200
RHP	14830	9647	6267	2.44	1.28	2.25	16,300
SKF UK	5486	2532	1524	8.96	7.15	10.00	43,500
Torrington UK	1560	1607	1217	(0.42)	5.99	1.00	21,200
INA UK	358	377	237	1.28	28.89	8.51	72,700
NSK UK			153				59,000
Timken UK		4000					

Notes: Productivity growth rates calculated after allowing for inflation of domestic currency by means of wholesale price indices. Exchange rate conversions as Table 6.1.

Figures not available for: FAG, Federal Mogul, Torrington, INA, N Thomson, SNR

* Exceptions to dates given:
1970 employees - figures for Timken and INA UK are 1972
1980 employees - figures for Koyo and NTN are 1981
1980-83 productivity growth - NTN is 1981-83 growth
Sales/Employee 1983 - Timken is 1980, NSK UK is 1978

Source: company accounts

Table 24 suggests that RHP's productivity growth has been reasonable compared with other major companies. This is partly because RHP has diversified into higher value-added electronic activities. However its productivity level of about £16,000 sales/employee still appears well below that of other competitors in other countries.

Productivity performance appears better for UK subsidiaries of overseas companies, but an increasing proportion of their UK sales is made up of products manufactured overseas.

The operations of multinational companies in different countries provide better evidence on this issue. Two plants, one in Britain and one in Germany, belonging to one company, were engaged as "dual sources" on the same automotive bearing product. Design, quality specifications and production runs were identical. I visited both plants to investigate productivity levels. An executive with experience of working in both plants stated that manning levels in the German plant were approximately 40% lower than in the British one. One factor was that German unions were more flexible, reflecting a much healthier industrial relations climate. A second factor was that responsibility for a wider range of production tasks was vested in the production operators themselves, and they were more actively willing and more appropriately trained for this responsibility (eg German operators involved were dual skilled).

I also visited both British and German plants belonging to a second company and found executives held similar views on the scale of productivity differentials and also on the causes. German executives in both companies were critical of complacency by UK production management. This was felt to reflect inadequate pay levels, and inadequate attention to the production function at a more senior level.

Both companies reflected criticisms, made by German and Japanese executives, of an exploitational style of management in Britain. They felt it was impossible to gain fuller and more active participation from production operators in an atmosphere in which productivity gains so frequently resulted in unemployment. Frequent recourse to

unemployment was perhaps inevitable so long as British management were content to allow their competitive position to be eroded.

There was however evidence that multinational companies, faced with increasingly severe UK conditions, were moving sharply to deal with such productivity differences. Until 1979 UK relative wage rates were on a downward trend sufficient to cushion this problem. By 1981 a rise of almost 40% reduced the gap between UK rates and those of its overseas competitors. Multinationals generally, stung by the effect this had on financial performance, adopted a much stronger line insisting that UK manning levels come into line with *levels in* other European countries: an example being SKF UK's January 1982 ultimatum to its workforce that unless this happened the plant would close. Productivity differentials within multinational companies could now be expected to be significantly lower, at least for comparable situations.

One Japanese company visited did not feel its UK plant (though under Japanese management) was behind Japan on productivity. The situation was not altogether comparable. The UK plant was small, very modern, and established on long production runs, and productivity was to a substantial extent process determined. However like the Germans they found UK operators individually competent and efficient. Using Japanese managers they seemed to have succeeded better at harnessing the loyalty, flexibility and active participation of their UK workforce as a whole.

Thus UK management has been complacent on the issue of

productivity, especially until recently, so that as UK wage rates moved more closely into line with international rivals' in 1980, international competitiveness and profitability declined sharply. British managers need to achieve the more constructive partnership with employees so actively fostered by their German and Japanese counterparts.

5.144 Other production issues

The issue of manning is important in itself, but it is also symptomatic of a wider malaise that has plagued UK manufacturing. Where there is not the will, either by management or by employee representatives, to insist on even sensible manning levels, there would seem to be little hope of matching concepts such as "built-in quality" that characterise German and Japanese manufacturing operations.

Such approaches, which would also seem critical to success in this sector, demand not merely even passive acceptance of change, but positive and committed pursuit of change by large numbers of production personnel. Progress here is more demanding, often taking several years of sustained and patient effort. Two things seem important.

First, top management in the UK need to recognise that in the context of this particular industry they cannot afford to treat such progress in production areas as a merely operational matter, viewed in the perspective of fairly short term operating budgets. For example, this sometimes involves intractable industrial problems. From an operating perspective, resolving these may be unattractive because of obvious risks, but establishing more healthy "precedents" may be vital to further progress and therefore

ultimately to competitive survival. Where necessary resolution of any such problems must be viewed as a strategic, longer term objective.

Second, and perhaps paradoxically, they need to rely less on externally imposed managerial control systems (eg ex post quality control checking systems) and to delegate more authority (and recognition) to production personnel. UK production management is poorly trained technically in comparison with Germany, and also in comparison with the USA on more general managerial issues; the main problem however is the poor level of morale in comparison with Germany and especially Japan (where training is not well developed). However, increased delegation of power and authority is unlikely to be effective unless there is first a better partnership between management and employee representatives; without this production managers are likely to be swamped by the task presented to them.

Methods of production seem likely to change in two directions. The first, only appropriate to extremely high volume order runs, is the introduction of a third virtually unmanned "ghost shift", a development pioneered by German manufacturers. This technology though is appropriate to few automotive bearings. It is not appropriate to UK manufacturers, given their withdrawal from volume market segments, and given a weak technological and financial position.

The other more appropriate challenge is to secure similar benefits to those presently obtained only with the advantage of long order runs on much lower order runs. This

is inherently difficult in bearings and represents both a technological and an organisational challenge: much progress can only be incremental and depends on wholehearted support by production personnel.

Although FMS technology might seem to benefit smaller producers particularly, the immediate outlook is that it is the larger companies who are best able to afford the investment that in this sector will probably be needed.

Changes in production technology appropriate to automotive bearings are likely to take place fairly slowly, but will probably encourage further international rationalisation.

5.15 Decline of multinational companies' manufacturing operations in the UK

5.151 SKF

The coherence of the parent company SKF's strategic position is readily comprehensible in an international perspective. As the world market leader, it offers the most comprehensive product range, is strongly supported internationally, and has integrated its operations to exploit benefits associated with volume. This has substantially cushioned its UK manufacturing operation against the decline in the UK market. In 1970, almost 90% of SKF (UK)'s bearing sales were UK sourced. By 1981, largely as a result of the "Global Forecasting and Supply System" programme (completed earlier), the majority of UK sales were sourced from overseas; but, conversely, most UK production was destined for overseas, so that dependence on

the UK market was reduced.

Along with most other companies, SKF has found the UK an increasingly unattractive base from which to source bearings. Table 25 shows company profit performances:

Table 25 Company profit performances (pre-tax)

Company	Av. Profit/Sales		Av. Profit/ Capital Employed	
	1970-80 %	1980-83 %	1970-80 %	1980-83 %
SKF	6.4	5.0	5.7	6.0
Timken	10.1		13.4	
FAG	2.2		3.2E	
NSK	5.0	4.1	5.8E	
Koyo	1.9	2.1		
Federal Mogul	9.2		13.2	
Torrington	Unpublished			
Nachi-Fujikoshi	2.3	3.1		
NTN	2.6	6.3		
INA	Unpublished			
N Thomson	3.9			
SNR	Unpublished			
RHP	5.1	3.5	8.2	5.1
SKF UK	1.0	(2.3)	(0.5)	(3.7)
Torrington UK	4.4	1.5	5.4E	1.6
INA UK	8.0	12.1	18.8	21.5E
NSK UK	(8.4E)		(18.9E)	
Timken UK	Unpublished			

Source: company accounts

SKF (UK) averaged pre-tax losses on capital employed of 0.5% between 1970 and 1980 and 3.7% between 1980 and 1983, during which periods the parent company averaged profits of about 6% ROCE. SKF (UK) remained profitable from 1970 to 1975 after which financial performance fell alarmingly: apart from a marginal profit in 1980, it declared pre-tax losses (even on a historical cost basis) in every year from 1976 to 1983! These results also incorporate marketing activities on behalf of the parent company which are said to

be more profitable than manufacturing operations.

SKF (UK)'s sales do not reflect UK manufacturing output and changes in employment levels give a better indication of SKF's commitment to manufacture in the UK in comparison to other companies. One should strictly allow for any differential growth in UK productivity as compared with other SKF plants, but this effect is small in comparison to employment changes.

Employment in SKF (UK) has fallen from 5,500 in 1970 to 1,500 in 1983; by comparison, SKF's employment worldwide fell from 67,000 to 46,000 over the same period. Table 26 shows employment for bearings activities only over the last five years, and compares the UK with SKF's other European operations.

Table 26 Employment in SKF's European bearings plants

	1978	1983	Reduction
Germany	10,180	8,188	20%
Italy	7,563	6,100	19%
France	5,754	3,685	36%
UK	3,440	1,162	66%
Other European	5,288	4,332	18%
Total European	32,225	23,467	23%

Source: company accounts

UK employment in bearings alone has been reduced to one third of its level five years ago, a reduction unmatched in any other European country. The UK operation has now retrenched onto a single plant at Sundon, having closed a second plant in the same area and its Scottish plant at Irving.

SKF's threat in January 1982 to close this last remaining plant, the first such ultimatum in fourteen years,

demonstrated even its precarious position.

A more recent changeover of the major UK production lines demonstrated how marginal the UK operation has become from the parent company's viewpoint: in the weeks involved manufacture was transferred to other European plants which absorbed the additional production without apparent problems.

SKF's automotive bearing manufacture, its major UK manufacturing activity a decade ago, has changed significantly: only a few automotive bearings are now manufactured in substantial volume. <> Significantly SKF's recent quotation for a volume order for BL Austin Rover was based on manufacture in Italy. The major factors keeping some manufacture in the UK are first that some local manufacturing capability is useful marketing support and, second, political particularly in view of employment implications.

5.152 Timken

Timken worldwide enjoy a unique niche, specialising in tapered roller bearings. They are the market leader in the US market and are supported by overseas manufacturing operations. The coherence of their position in international terms has been reflected in consistent success, in terms of market and financial performance, and on other indicators such as employment and productivity, as shown in Tables 21, 24 and 25. Its US base is reputed, however, to have been more profitable than Europe. In 1977 the company employed about 23,000 people in the USA, 4,000

in the UK at two plants, Duston and Northampton, and 1,300 in France. It also has other manufacturing operations outside Europe and the USA. The UK operation is helped by the strength of its parent company and also by its historical position as the main base for the parent company's attack on the European market.

However Timken's parent company is perhaps even more sensitive than SKF to what it perceives as a decline in the UK's attractiveness as a manufacturing location. SKF has integrated international manufacturing operations so as to maximise the long term benefits, associated with scale and experience effects, resulting from plant specialisation: so it is less inclined to move production between countries when the relative cost position changes. SKF's structure also provides some cushioning against the effect of exchange rate movements. Losses in one country are partially offset by gains in other countries. Also if sterling rises any losses on UK manufacturing operations tend to be offset by additional profits on UK marketing operations, since a high proportion of their sales are sourced overseas. Timken is less internationally integrated and they are therefore highly sensitive to the UK's relative cost position.

Timken specialise in tapered roller bearings (about 20% of the market) and their products are heavily automotive orientated. They point to a step change in the cost of keeping up with new technological and manufacturing developments in automotive bearings, and foresee an intensification of international competition as leading to a "shake out" of less competitive operations.

For this reason Timken UK is particularly critical of

UK economic choices that have rendered UK operations less internationally competitive. Their cost position has been influenced by real exchange rate movements (nominal rates adjusted for differential inflation rates). Thus in 1973 they wanted to source as many bearings as possible from the UK following the fall in sterling. By contrast at the real exchange rate prevailing in 1981, the CEO's review of his UK operation suggested that the UK simply did not constitute a competitive base from which to manufacture. He felt the country had "effectively made the decision to trade North Sea Oil off against a substantial part of (the) industrial sector". Automotive bearings are especially vulnerable to such economic issues because they are price sensitive and transport costs, even as far as America, represent only about 5% of sales value.

Graphs showing trends in relative UK labour rates in manufacturing are shown in Appendix D.5. They confirm that a substantial drop in UK competitiveness took place between 1979 and 1981, making a discontinuity with trends over the previous twenty years. Since then there has been some return to past trends in the UK's relative position against the USA and to a lesser extent against Japan. This should improve Timken UK's position as against US manufacturing operations. However the UK cost position is still seriously out of line with European countries. Not only does this create an incentive to transfer production to France, but it continues to undermine Timken's position against its key overseas competitors who are European.

It was also a question of market attractiveness, but

Timken UK's customers were also manufacturers highly dependent on their international cost position; the declining customer base reflected similar problems. Competitive decline in the UK was a collective phenomenon affecting manufacturing generally.

Timken see their own competitive position in automotive bearings as stronger, due to parent company support, than any other UK manufacturer. Nevertheless they did not see UK manufacture of this product continuing on any substantial scale in the long term, unless the business environment became radically more favourable.

5.153 Other manufacturing operations in the UK

A detailed analysis of other multinational companies' UK bearing manufacturing operations is given in Appendix B.3.. Tables 24 and 25 provided an indication of profit and productivity performances in comparison to key international competitors. Appendix B.3 supports two clear conclusions from this section.

First, multinational companies have had to reorientate their international operations in order to face intensifying international competition. Second, operations marginally competitive internationally have suffered disproportionately. This has applied to virtually all UK subsidiaries, and partly reflects a UK business environment unfavourable to international competitiveness.

5.16 RHP's competitiveness

As the only British-owned manufacturer of automotive

bearings and the UK market leader, RHP's competitive situation will now be examined in detail.

5.161 RHP's broad strategy

As international competition intensified during the 1960's, Britain's competitive position declined. Exports of bearings, over 75% greater than imports in 1963, were only 36% greater by 1969. In such circumstances the Government viewed with alarm a takeover bid by SKF (UK) for Ransome and Marles, the largest of three major national bearing companies, which would almost certainly have left Britain with no viable UK-owned companies in the industry.

The resultant strategy, supported by financial assistance from the Industrial Reorganisation Corporation, was a merger of the three remaining UK-owned companies to form RHP and this was followed by a programme of consolidation and rationalisation. Such a broad strategy was to some extent dictated by a situation in which the competitive position of the UK industry had been allowed to weaken seriously. It was predicated on the assumption that the key weakness was one of scale and over-fragmentation: consolidation rigorously pursued promised to alleviate this weakness, and provide a stronger base for exports.

British productivity was recognised to be weak and key manufacturing developments being pursued by other world companies offered the promise of radical improvements. The seductive simplicity of such broad strategic thinking has ultimately proved superficial and misleading. By effectively mimicking their strategies RHP has plunged into head-on competition with powerful world (not merely

national) market leaders. This almost inevitably has contributed to deterioration in its competitive position in virtually all the major automotive bearing market segments, leading to a costly (in both financial and human terms) process of retrenchment.

A key target in this strategy was to achieve longer production runs. This was done successfully by standardising the product range: the number of product variants being reduced from about 15,000 to 5,000 within just a few years. Factories were accordingly reorganised, so that production lines could be developed focused onto particular bearing types so as to exploit the advantages of experience effects and longer production runs.

Bold export targets were set, as the company optimistically planned to take advantage of Britain's entry into the EEC and a more international pattern of business.

RHP's subsequent performance is analysed in Table 27.

Table 27 RHP's performance 1970-84

Year to 30 Sept	Sales £m'80	Profit £m'80	Margin	ROCE	Sales/ employee £'80	Exports £m'80	Non-bearing activities % / sales
1970	148	7.0	4.7	3.1	10,000	24.7	-
1971	150	8.5	5.7	4.7	10,800	32.0	-
1972	135	3.5	2.6	2.6	10,900	24.3	-
1973	141	2.4	1.7	2.3	12,700	26.6	-
1974	126	6.8	5.4	4.6	11,800	29.1	-
1975	125	11.5	9.2	8.4	11,900	24.9	4
1976	132	8.6	6.5	5.9	12,500	23.8	12
1977	119	7.2	6.0	4.8	11,300	23.8	14
1978	114	4.9	4.3	3.2	11,600	24.2	14
1979	114	6.1	5.4	6.3	11,700	28.4	18
1980	120	11.0	9.2	17.5	12,400	31.1	21
1981	105	0.7	0.6	1.2	12,300	25.2	24
1982	91	3.3	3.6	6.5	12,900	20.1	27
1983	81	0.5	0.7	1.1	12,900	17.6	29
1984	79	4.6	5.9	9.8	13,800	18.6	27

Source: company accounts

Allowing for initial disruption, results in the first few years looked promising. Under favourable market conditions sales volume fell only slightly as product lines were rationalised, and by 1973 productivity had been pushed up about 27% above 1970 levels. ROCE recovered, after being depressed in 1972 and 1973, peaking at just over 8% in 1975.

By 1974 a fundamental weakness in this volume orientated strategy was becoming evident. The benefits associated with volume seem greater in this sector than for many other components. Had competition remained predominantly UK, this strategy would probably have continued to serve RHP (as the UK market leader) extremely well. Yet in the volume market segments particularly, RHP faced increasing competition from more powerful international competitors, better supported internationally to pursue precisely the same benefits associated with volume. The prospect of cost reduction had seduced RHP into head-on confrontation with international competitors that it was unlikely to be able to match.

RHP's competitive problem was by 1974 already apparent in popular metric segments of the market, where production runs were the longest. Fierce Japanese competition, particularly from NSK which had specialised in these market segments, hastened moves by other competitors. By 1974, SKF's "GFSS" programme, integrating manufacturing operations throughout Europe, had improved its competitiveness in volume market segments. In the ensuing price war as SKF retaliated against low priced Japanese competition, RHP was gradually squeezed out. The same theme was to repeat itself

in the major automotive market segments, as will be discussed in section 5.162 below.

Such problems called for some decisive readjustment to this strategy. To have succeeded, such a volume orientated strategy would have called for a much stronger international position, but some options had been ruled out by the UK government's original decision (perhaps also influenced by defense considerations) to opt for a UK-only solution. Many international options risked compromising the company's future independence and sovereignty, something not likely to have been attractive to senior executives. A major international move similar to BL's linkage with Honda might well have been another possibility.

Having decided against major international moves, RHP was nevertheless reluctant to reverse its volume orientated stance. RHP was already deeply committed, and any trimming back in volume market segments would have meant painful surgery, cutting out substantial capacity. This was later forced on RHP but at this time rather than grapple with critical competitive problems, RHP was distracted by a third alternative.

Whilst maintaining its original strategy in bearings, it simply diversified through a rapid acquisition programme into the unrelated but attractive area of electronics. This can be seen in Table 27 above. Presumably RHP hoped by this means to bolster a weakening position in bearings, and ultimately reduce its dependence. It is too early to evaluate the success of these new electronics activities, though competition is likely to intensify here also; but by

diverting scarce investment funds and senior executives' attention (particularly after the retirement of their original chairman in 1976) this further weakened RHP's competitive position in bearings.

Whilst imports were continuing to penetrate RHP's home market, its export strategy lay in ruins: by 1980 export volume was no higher than in 1971, and between 1980 and 1983 it fell by 43%. Sales volume fell from £150m in 1970 (at 1980 prices) to £120m in 1980 and then £80m in 1983. This was despite other new activities, which rose from 4% of total sales in 1975 to 23% in 1980 and 29% in 1983.

5.162 Strategies in automotive bearings

5.1621 Overview

Table 28 gives some introduction to the main automotive market segments now to be discussed. Appendix B.2 shows bearing locations on a conventional rear wheel drive car.

Table 28 Main market segments taking the example of a British conventional rear wheel drive car

32%	25%	20%	10%	5%	8%
Rear wheel, differential and prop' shaft bearings	Wheel bearings	Gearbox bearings	Clutch release bearings	Water pump spindle bearings	Electric motor bearings, steering related and others
Mostly tapered roller bearings but other options possible	May be tapered roller or ball bearings or integrated hub units	Mainly cylindrical or needle bearings	Specialist fabrications incorporating ball bearings. Higher "value added" but needing innovative applied engineering	Double row deep grooved ball bearings, either supplied separately or as part of a complete fabrication	Starter motors and alternators require standardised small diameter radial ball bearings
Timken, SKF, RHP and others	RHP, SKF, Timken, Koyo, SNR	RHP, SKF, INA, Torrington	INA, RHP, SKF	RHP, SKF, FAG	NSK; SKF in electrical, Torrington in steering applications

The market for popular metric sizes of bearings, from which RHP had been forced to retreat, had involved order runs up to as much as 10,000,000 units p.a.. The only automotive applications in this class are for starter motors and alternators. Most automotive bearing orders are smaller. <>

Yet the fierce competitive battles in the popular metric segment heralded a similar increase in competition in other volume segments. Current manufacturing developments are also likely to raise competitive stakes still further. RHP has been better protected against this competition on

imperial size ranges since international competitors, with the exception of US rivals, are orientated to metric ranges; but even BL, with whom RHP fortunately enjoys a close relationship, must be under some pressure to move to metrification, especially in view of its Honda link. On Ford's volume business, which is metric, RHP no longer seems cost competitive against SKF.

5.1622 Wheel bearings

The more international pattern of competition has "raised the stakes" in wheel bearings, one of the largest automotive markets. SKF have developed an "integrated wheel hub bearing", a logical move from a component company's viewpoint, since the new product provides increased added value, utilises engineering expertise and so provides one direction for growth in an otherwise static market. This corresponds well with vehicle company needs for more engineering support and simplifies their own assembly operation. However even for the world leader SKF this represents a very bold investment, ($25m), recoverable only through exploiting the larger international market.

General Motors-owned US subsidiary New Departure Hyatt has followed suit. Timken have been developing their own variant on the integrated wheel hub bearing for 12 years now (illustrating the time scales involved in such major product developments).

RHP has not been able to keep up with such moves. It appears to have neither the financial resources nor the worldwide marketing capability to respond to such technical

developments, even in this core area of the automotive bearings business. In the future its competitive position may become even more vulnerable if, as some predict, further product integration takes place with component suppliers perhaps collaborating and producing an integrated unit incorporating constant velocity joints.

5.1623 Water pump spindle bearings

One strategy open to RHP was to concentrate on a particular segment of the automotive market, in the hope of becoming the major European specialist. Accordingly, RHP focused onto the water pump bearings segment and dedicated one of its factories onto this product. New markets were captured through aggressive pricing; but powerful German and Japanese competition forced punishingly low prices. RHP did not seem able to exploit potential volume advantages (such as "experience" effects) sufficiently. Accumulating losses and cash flow difficulties, exacerbated by more difficult business conditions in the UK, ultimately forced RHP to close its Northampton plant specialising in this product. Much of this business has been transferred elsewhere in the group, but any momentum has been lost and RHP are no longer rated as one of the key competitors in this product area.

With hindsight, this failure seems unsurprising: even Koyo Seiko, who were active in water pump bearings, have been forced by the strength of German competition to retrench dramatically in the German market. The high price of failure though is recorded in the high level of RHP's recent "extraordinary" costs.

5.1624 Clutch release bearings

If RHP has found itself increasingly squeezed in the volume segments, another alternative might have been to develop a role in terms of customer applications. This strategy has been successfully pursued by INA as a way of extending its base beyond needle bearings.

An important example is clutch release bearings. Like integrated wheel hub bearings, clutch release bearings represent higher value added as the product encompasses bearings as part of a complete assembley. This business segment is more closely customer orientated and profits are earned through engineering innovation, aimed at solving particular customer design problems. For a good problem solving design, the price can reflect not so much manufacturing cost, but how much it is worth to the customer to have his problem solved (eg in avoiding warranty costs). Profit mark-ups can for a time at least be considerably higher than on established bearings products, and the key to competiveness is technical innovation and good applications engineers working closely with customer design teams. Patenting can also be important.

This area is perhaps better suited to RHP's technical strengths, given its relative weakness on the manufacturing side. In the event, however, it was INA that "stole a march" on both RHP and SKF, with the development and introduction of the self aligning clutch release bearing, one of the few major recent developments in this market.

Although RHP later responded with its own self-aligning clutch release bearing, the product's technical reputation does not appear to be as high. SKF has responded with new

product programmes and is reported to have a "string of patents" coming out. The battle between SKF and INA is expected to intensify.

In this type of application, RHP's competitiveness seems also to have slipped back in the face of international competitors' more substantial engineering resources. Also although RHP's technical reputation seems high in some respects (eg aero), Germany appears particularly strong on basic applications engineering. One reason cited for Japanese retrenchment in the German market was their inability to match German application engineers. The emphasis on, and pace of basic technical innovation (eg on CAD/CAM developments) seems higher in Germany than in either Britain, America, or Japan.

5.163 Appraisal

In addition to difficulties arising from a broadly volume-orientated approach, RHP seems to have extended itself over too many fronts, particularly given its weak base. One by one its strategic thrusts have petered out, forcing it finally to retrench onto what is now a coherent (if much smaller) role as a supplier of "specials".

Yet the wastage resulting from not having attained a more cogent strategy at an earlier stage, and the price ultimately paid due to competitive decline have been considerable both in human terms and financially.

In spite of its weak market perfomance, RHP's cautious financial policies might seem on first inspection to have paid off in terms of profitability. Table 25 indicated that

RHP's profitability, though lower than US competitors, has been better in relation to other international competitors such as Japanese companies. Its pre-tax return on capital employed averaged 8.2% during 1970-80 and 5.1% during 1980-83. Yet this performance is less satisfactory if Britain's rate of inflation and high cost of finance is taken into account.

Table 29 shows RHP's recent profit performance, both on a historical and on a current cost basis, and also highlights "extraordinary items" not included in profit figures.

Table 29 RHP's recent profit performance (£m)

Year to 30 Sept	1980	1981	1982	1983	1984
Pre-tax profit on historical cost basis	11.02	0.75	3.93	0.66	6.23
Pre-tax profit on current cost basis	2.1	(4.1)	(2.8)	na	na
Extraord. items (pre-tax) associated with closure/ redundancy	(8.17)	(4.05)	(1.24)	(2.32)	-
Exceptional costs associated with retrenchment on continuing operations	0.0	2.21	0.61	0.34	0.61
Total costs associated with retrenchment	(8.17)	(6.26)	(1.85)	(2.66)	(0.61)

Source: company accounts

RHP's performance on a current cost accounting basis (arguably more relevant when assessing a company's overall strategic situation) reveals a much worse position. Even on a historical cost basis virtually all £16m of profits accumulated between 1980 and 1983 were eaten up by "extraordinary items" associated with plant closures and

redundancies.

Total costs associated with such cutbacks were in fact £19m over the same period, with only about £3m having been included as "exceptional items" in the calculation of profit figures. Most of these costs were attributable to the closure of RHP Automotive Division's Annfield Plain factory (involving about 1,250 redundancies) and its other automotive plant at Northampton, making water pumps and associated spindle bearings. These largely reflect the price paid for allowing competitive decline, and must be borne in mind in assessing the company's strategic situation in automotive bearings.

Table 30 shows the proportion of RHP's overall sales and profits (unadjusted) represented by bearings.

Table 30 RHP bearings' activities as a % of total sales and profits

Average for years:	1975-79	1980-83	1984
% of total sales	88	75	73
% of total profits (pre-interest)	64	36	53

Source: company accounts

Profitability in bearings has been lower than for RHP as a whole. Sales volume in bearings has also fallen more sharply than for the company as a whole: in 1980 prices, bearing sales fell from £120m in 1975 to £95m in 1980 and £58m in 1983.

Employment has also suffered. For RHP as a whole this fell from 14,800 in 1970 to 9,600 in 1980 and 6,300 in 1983. Employment in bearings activities only fell even more

sharply from 14,800 in 1970 to 4,700 in 1983.

To summarise RHP's performance has been poor in terms of both market and financial performance, and the situation has deteriorated markedly in more recent years. The level of productivity remains well below that of key competitors and competitive decline has extracted a high price both financially and in terms of employment.

RHP's problem in dealing with a more European pattern of competition was daunting. Despite a high export ratio its share was little more than about 1% even in its strongest markets in continental Europe. Table 22 showed this was marginal in comparison with key competitors. These markets were already highly integrated by the time Britain entered the EEC so that the competitive situation was asymmetrical. It was difficult for UK companies to break into continental markets where the pattern of competition was already consolidated and highly oligopolistic; continental companies, on the other hand, perceived the UK as the one remaining market "up for grabs". One UK marketing subsidiary explained how this factor had increased their parent company's support: "Just tell us what you need and you can have it!". RHP's difficulty has been compounded by having to operate from a UK base that other companies too have found uncompetitive.

Nevertheless, I believe RHP would have fared better had it been more sensitive to strategic context. Its sequence of strategies can be expressed in fairly general terms: merging to achieve consolidation of domestically owned industry, rationalisation aimed at improving financial

performance, increased volume orientation, market retreat, retrenchment and further rationalisation as the company closed its two automotive orientated factories and finally found a new if much smaller role as a specials manufacturer.

In contrast more successful strategies in this sector appear coherent and sensitive to contextual issues. Some companies (particularly the most powerful, eg SKF, Timken and NSK) do seem to have benefitted from bold fairly simple strategic designs; but others such as INA seem to have succeeded through responsiveness to subtler opportunities. RHP too would have probably fared better had it opted for a more flexible customer orientated approach, aimed at strengthening its relationships with vehicle companies. There have been important opportunities arising out of customers' needs for a new type of service. Rubery Owen's collapse in wheels, after BL changed its sourcing policy, demonstrates that even long established suppliers cannot afford to take their position for granted.

Further no company seems to be able to afford to ignore sometimes quite basic issues, which are nevertheless critical to success in the context of its particular industry and circumstances. In this case, issues in the production area seem particularly important. RHP and indeed other UK manufacturers simply could not afford to get behind on issues such as manning levels. Senior executives needed to recognise the strategic significance of this and other specific issues in the production area, such as quality and more recently flexible manufacturing methods.

Progress in such matters would also seem to depend on policies designed to enhance the morale and commitment of

those in the production area, particularly lower level production management; a longer term and more constructive partnership with employee representatives than has been achieved by both sides in the past also seems necessary.

5.17 Conclusion

This sector has been directly affected by internationalisation more rapidly than other automotive component sectors. This is only partly due to the product's price sensitivity and low transport costs. The more critical factor has been market opportunities opened up by technological change, reinforced by benefits arising from volume production, which are probably higher than in many component sectors. Customer requirements have also been an important factor. In consequence the radius of competition between companies has already become Europe, and further rationalisation looks set to occur on a yet more global scale over the next ten years.

The performances of UK manufacturers in this sector have declined alarmingly and fairly comprehensively. An underlying problem has been the erosion in the UK's international competitiveness. This affects manufacturers directly and also indirectly since customers, also under international pressure, have had to insist on a more internationally competitive service.

All manufacturers have been damaged by an exceptionally unfavourable business environment in the UK, but management have also been responsible.

The only UK-owned manufacturer, RHP, exacerbated

problems through insensitivity to changing competitive circumstances. Its original volume orientated strategy, coupled with the demands from competing on too many fronts, proved unsustainable in the face of international competitors better supported to pursue similar aims. Initial financial benefits were subsequently eroded as the company was forced into costly retrenchment, and its present position appears weak in most automotive bearing markets. A more flexible customerised stance, aimed at strengthening its relationship with UK vehicle assemblers would have been preferential. The scope for offsetting a declining UK market through exports proved limited because of the company's limited international strength, close often nationalistic supplier/assembler ties on the continent, and erosion in the UK's cost position.

For most manufacturers including RHP however, the main problem was a failure to recognise and deal with the strategic implications of fairly basic issues in production areas particularly productivity, quality and more recently approaches to improve flexibility. The effects became acute as competition intensified after about 1979.

Armed with more cogent and positive strategies, UK management needs to seek a much stronger partnership with employees, such as that so actively fostered by Japanese and German managers. Some shift in organisational emphasis will also be required to reinforce the efforts and morale of production personnel.

The UK manufacturing operations of most multinational companies are now virtually peripheral, and the market position of RHP, the only UK-owned manufacturer appears

extremely weak in most automotive segments. Thus the threat to this sector's future is urgent. The costs of allowing decline make it in everyone's interests to cooperate and coordinate their efforts to restore competitiveness in this sector.

5.2 Automotive Forgings

5.21 The UK market

As will be discussed in 5.22 international trade in forgings is low, so that UK manufacturers' sales figures also provide a fairly accurate indication of market trends.

Table 31 Sales of forgers by value

	1973	1975	1977	1979	1981	1983
Sales £m	144	243	320	344	273	230
WPI, 1980=100	33.32	50.69	71.22	85.96	110.6	128.0
Sales £m'80	430	480	450	400	250	180

Source: Business Monitor MLH 399.5

Sales fell 58% between 1973 and 1983 after inflation, but tonnage output figures are analysed directly in Table 32.

Table 32 UK production of forgings (all types), '000 tons

1965	1969	1973	1975	1977	1979	1981	1983
662	547	538	501	477	451	282	222

Source: National Association of Drop Forgers and Stampers, Economic and Statistical Review, various issues.

Over the same period 1973-1983 the tonnage reduction was 61%, suggesting that price/ton has risen marginally faster than the general wholesale price index. Total forgings production in the UK in 1973 was 0.54m tons, similar to the figure in 1969. Production gradually declined to 0.45m tons in 1979 before tumbling dramatically to 0.28m tons in 1981, and continuing down to 0.22m tons in 1983. Whilst the industry has displayed considerable decline over the longer term, the reduction in output since 1979 to only

half the previous level by 1983 is thus unprecedented on past trends.

Table 33 Forgings sales by customer sector, '000 tons

	1972	1977	1979	1981	1982
Total forgings	540	477	451	282	252
Cars, vans	201	122	106	71	59
Com' vehicles	123	140	149	78	74
Tractors	117	80	65	44	34
Other mobile	9	36	35	27	19
Other	90	100	97	61	66
% Cars, vans *	37.2	25.5	23.4	25.1	23.3
% Com' vehicles	22.8	29.4	33.0	27.7	29.4
% Tractors	21.7	16.7	14.4	15.7	13.5
% Other mobile	1.7	7.5	7.8	9.7	7.5
% Other	16.6	20.9	21.4	21.8	26.3

* Exports have been apportioned on basis of home production.
Source: National Association of Drop Forgers and Stampers, "Economic and Statistical Review", various issues.

In 1982 cars and commercial vehicles represented 53% of sales, with other mobile equipment (tractors and earthmoving equipment) representing a further 21%. Forgings for cars and vans declined particularly by 1982, to only 29% of the level in 1972.

Other major markets in 1982 were mining (5.0% by weight), pipeline equipment (4.9%), mechanical engineering (4.4%), industrial engines (1.1%), aircraft (1.0% by weight, but more important on the basis of value), agricultural machinery (0.9%), railways (0.7%) and the government (0.7%).

This can be compared with 1965: motor cars, commercial vehicles, and tractors together accounted for 80%, mechanical engineering 8%, mining 2.4%, aircraft 1.7%, railways 1.3%, shipbuilding 0.9%, others 6.4%. The fastest growing segments have been pipeline equipment, an almost negligible market 10 years ago, and mining equipment. Sectors particularly hard hit by decline have been

mechanical engineering, shipbuilding and railways.

In the main, however, severe market decline between 1979 and 1981 was comprehensive, allowing little potential for offset. Despite the wide range of customers served, virtually every market segment declined over 30% in the course of one year, 1980. The best performance in this year was in the aero segment with a decline of "only" 19%: and this segment declined further a year later.

Thus if output growth is taken as an indicator of "competitiveness", competitive decline in this sector is very much part and parcel of competitive decline of British industry generally.

This raises further questions that must be answered. Are we dealing merely with a knock-on effect of decline elsewhere? Or has the international competitiveness of this sector too been allowed to decline, contributing to problems? If so what are the key issues that must be dealt with?

5.22 International trade in forgings

Classification problems render trade figures unreliable and official figures tally poorly with responses received by NADFS from its members. Official Business Monitor figures shown in Table 34 were available only up to 1976 but give some indication of trends.

Table 34 International trade in forgings 1972 - 1976

	1972	1973	1974	1975	1976
Exports FOB £m	3.8	6.2	12.1	17.3	17.4
Imports CIF £m	0.45	1.1	2.6	5.3	6.6
Trade surplus £m	3.4	5.1	9.5	12.0	10.8
Exports/imports (value)	8.4	5.6	4.7	3.3	2.7
Home market £m		138	180	231	262
Imports home market %		0.8	1.4	2.3	2.5
Exports FOB, '000 tons	14.4	25.9	36.1	38.1	32.4
Imports CIF, '000 tons	1.2	2.8	6.5	na	na
Exports/imports (wt)	12.0	9.2	5.6	na	na
Exports value £/ton	264	239	335	454	537
Imports value £/ton	375	393	400	na	na

Source: Business Monitor MLH 399.5

Import penetration is not high but has been rising, from 0.8% in 1973 to 2.5% in 1976. This was faster than the growth in exports, and the ratio of exports/imports (by value) fell steadily from 8.4 in 1972 to 2.7 in 1976. By 1976 the trade surplus had fallen to only 4% of the value of the home market.

In terms of international trade, the sector has been competitive in the past, but there are clear signs that this competitive position has been declining with imports growing much faster than exports. Export prices per ton appear to have been lower than import prices, though there was some closing of the gap in 1974, indicating a tendency of the UK to buy in dear and sell cheap. This suggests UK manufacturers are tending to concentrate on the lower value added end of the business, at least as regards international trade.

More recent international trade ratios, compiled by the Department of Industry, are shown in Table 35.

Table 35 International trade - recent trends

	1978	1979	1980	1981
Imports/home demand	5.9%	5.5%	6.3%	6.1%
Imports/ " " plus exports	5.5	5.0	5.7	5.8
Exports/manufacturers sales	8.4	9.6	9.6	4.9
Exports/ " " plus imports	7.9	9.1	9.1	4.6

This suggests a generally more stable situation, with the exception of a surprisingly sharp fall in export ratios in 1981.

In fact, official figures seem to underestimate the impact of trade. NADFS export figures, which seem much closer to the mark, indicate exports have been gradually rising - from 5% of total output in 1969, to 10% in 1973, 13% in 1979, 14% in 1981, though falling back a little to 12.8% in 1982 (NADFS, Economic and Statistical Reviews). Industry sources suggest real figures for imports would also be much higher.

The direct impact of international trade is less important than in automotive bearings, affording manufacturers less scope to offset UK market decline through exports; yet it has increased significantly. There are clear signs, moreover, that this sector has become less internationally competitive than in the past.

5.23 The structure of competition

5.231 Introduction

Competition in forgings is extremely fragmented with over 100 companies involved. Probably over 60 of these companies are actively involved in automotive forgings of some type or another. The exact number at any one time is

difficult to determine: although there is some tendency for smaller companies to specialise in particular business segments, they tend to switch segments depending on business conditions. If demand picks up in a particular market segment there is a tendency for new entrants to be sucked in.

Although there are many companies making forgings, the largest manufacturer GKN Forgings accounts for about 45% of all production and their factories number 5 of the top 8 in the industry. In 1965, their share of all forgings was reported by the Monopolies Commission (1967)to be 44%, after adding back the output of Ambrose Shardlow and Birfield Extrusions which were subsequently taken over. GKN's general market position would thus appear to have been fairly stable.

GKN's share of the automotive market at that time was, however, considerably higher at 66%. This market was split BL 59%, GM 17%, Ford 14% and Rootes (now part of Peugeot) 9%, GKN's respective shares being 68%, 44%, 79% and 75% (ibid).

5.232 Entry and exit barriers

Entry barriers in terms of setting up new factories are high and this has deterred new plants being set up either in the UK or overseas, either by GKN or other advanced countries. <>

Exit barriers are also high. In closing plants companies have found that the effective scrap values were virtually zero. Numerous smaller companies are still family controlled and less financially orientated. It is therefore

extremely difficult for capacity in the industry to adjust downwards in the face of falling demand.

A subtle factor exacerbating this, is that forgings capacity is highly "modular". If sales fall it is relatively easy to isolate and mothball particular items of plant (much of this equipment is anyway fully depreciated). By contrast, in the competing process of castings the process is technically highly integrated and fixed costs are higher. Falling demand here has led to many more plant closures (there have been surprisingly few in forgings), since the cost penalty entailed in running below full capacity is more serious and there comes a point where you either operate the whole plant or not.

Competition from substitute products such as castings has thus also been particularly fierce. Castings have gained ground particularly in the car market. One German car manufacturer professed little further interest in bought-in forgings because of more attractive alternative processes. Other alternatives such as fabrication or machining have also gained ground, and alternative materials such as plastics have displayed extremely rapid growth in some automotive applications. Forgings appear to have been cushioned against such competition only on highly stressed parts, such as commercial vehicle crankshafts, and some safety critical parts where their stress characteristics are more at a premium.

Within the forgings sector low utilisation, the presence of numerous fairly heterogeneous competitors, and high exit barriers have led to fierce rivalry.

5.233 Competition and competitor groupings

Table 36 The major forging companies* ranked by employees

	Employees
GKN Forgings (1)	14,401
Daniel Doncaster (2)	1,500
Cameron Iron Works	na
Firth Brown (3)	1,550
High Duty Alloys	1,800
Deritend (4)	830
Bloxwich Lock and Stamping Co	720
Burton Delingpole & Co	na
George Turton Platts & Co	530
Omes-Faulkners	500
Head Wrightson Stampings	400
Stampings Alliance Ltd	350
The Hughes-Johnson Stampings Ltd	349
T.B. Wellings	283
George Morgan	275
Chemetron	260
Perkson Forgings	250
Brockhouse Forgings	250

(1) Garringtons, Shardlow, Forgings and Presswork, Kirkstall, Smethwick Drop, Smith Clayton, Scottish Stampings, Birfield Extrusions
(2) Monk Bridge, Sheffield
(3) Firth Derihon Stampings, River Don Stampings
(4) South Wales Forgemasters, Bescot Drop Forgings

*In addition there are over 80 smaller forging manufacturers.

Companies can be categorised by customer industry to some extent. This applies particularly to the aero sector, which involves quite different quality assurance systems, factory through times, price levels etc. High Duty Alloys enjoys a distinctive aero niche, though other major aero suppliers such as Daniel Doncaster are also involved in the automotive market. Cameron Iron Works is mainly involved in pipe line applications. Most companies however maintain a broad customer spread and are prepared to change this mix opportunistically.

Some categorisation derives from equipment employed and

often can be stated in terms of the range of forgings weights that can be handled. For example, George Turton Platts advertises its main range as 10-300kg compared with Omes-Faulkners at 0.25 to 22.5kg. Most companies find their ranges overlap to a considerable extent.

The major distinction with regard to equipment is between those companies engaged on hammerwork, the more traditional process involving forming by means of repeated blows, and companies employing presses. The latter process attains comparative advantage particularly where longer production runs are involved. The larger companies such as GKN were particularly quick to introduce such equipment in the 1950's, as part of an attack on volume segments, particularly in the automotive market. However, even GKN would maintain a balance between presses and hammers and often the two processes are in competition, so competitors cannot be classified exclusively on this basis.

Forging applications on both cars and trucks are shown in Appendix C.1, and there is some degree of clear differentiation by product. However, firms generally also provide a flexible jobbing service. One recent trend favourable to some larger companies such as GKN has been vehicle companies wanting quotes on "packages" of forging products, often linked to another recent trend, single sourcing, which is similarly aimed at cost reduction.

A more important distinction here applies to safety critical parts where quality control standards are higher and subject to regulation, eg on steering applications. A number of companies have pursued strategies based on specialist niches afforded by some of these applications

(see Appendix C.6).

5.234 Other sectoral characteristics affecting competition

Transport and handling costs reflect the low value of rough forgings in relation to weight and bulk. There used to be some distinction between companies originally set up mainly to serve Scotland, such as Cameron and GKN Scottish Stampings, and others set up to serve the rest of the UK. This has become less important and many Scottish companies now "export" a high proportion of their forgings to English markets.

Steel represents half the cost of forgings and so is potentially an important feature of competition. Access to steel on favourable terms is possible to a limited extent for the largest companies, particularly GKN. Originally, GKN's access to its own steel supplies was as much an advantage in respect to quality as cost. Today, quality standards on steel are probably more homogeneous, and steel prices are in theory regulated throughout the EEC. In practice, even within the constraints of EEC bureaucracy, companies such as GKN can still gain a slight cost advantage on steel.

Britain is unique in the extent to which the forgings sector has developed independently and only about 8% of forgings are produced "in-house", by either steel producers on the one hand or forgings customers on the other. In-house production is relatively much more important in France and Germany where it represents about 30% of the total, and also in Japan.

5.235 Overseas competition

The main threat posed by overseas competition is indirect through forgings coming into the UK as part of vehicles, for example, manufactured overseas. Although increasing, direct international trade has generally been inhibited because of limited market and technological opportunities, high transport costs, and the need for some customer liaison.

Particular markets display much higher exposure. An extreme example some years ago was the way in which forgings for the heads of golf clubs were taken over by foreign competitors. The pattern of competition in this small segment is now highly "global" in nature, with most of these forgings being supplied from outside Europe even. Forgings which can only be done on the largest presses, or on more specialised equipment (as happened in cold extrusion), tend to be traded internationally as manufacturers in one country "steal a march" on those in others. Longer production runs are more likely to be worthwhile sourcing overseas. Vehicle assemblers, especially in the UK, have become much more active in their international purchasing operations, so that suppliers are increasingly exposed to international competition.

An increasing number of newly industrialised countries are now developing competitive forgings industries (viz Turkey, Mexico, the Far East and Eastern bloc countries), and these pose some threat in the long term to the UK, in view of the very low prices being offered. The main import threat is however from Europe: from German manufacturers at

the top end of the market, and Italian and Spanish manufacturers at the cheaper end.

Larger companies, such as GKN Forgings, are much more affected by international competition because their comparative advantage vis a vis smaller manufacturers tends to rest on precisely the characteristics that promote international trade: an emphasis on volume, on new products and new technology. International competition, or at least the threat of it, also appears to be undermining their former advantage due to a stronger negotiating position with UK customers. This is particularly so in the automotive market.

On the continent not only is there a much higher proportion of in-house forgings production, but supplier/ customer ties are also still much stronger, Fiat in Italy being an extreme example. UK manufacturers' relative independence, which used to be advantageous in permitting better production volume, is now proving a liability because international competition is developing asymmetrically. UK forgers are being frustrated from gaining a real foothold in Continental markets because of close supplier/customer ties, whilst they themselves are increasingly under attack.

5.24 Performance analysis of automotive forgers

A detailed analysis of sales and profit performances of forging companies, over the last 7 years, is given in Appendix C.2. Supporting figures for individual companies are given in Appendix C.3. The few companies identified as carrying out no automotive work have been segregated. In

order to gain an understanding of the competitive situation among UK manufacturers in such a fragmented industry, 36 automotive forging manufacturers with continuous figures have been analysed. The companies have also been ordered on the basis of turnover in 1976/77 at the start of the period, and then classified into 6 size groups in order to check for any performance / scale relationships. These will be examined in the next section, after first using the analysis to examine the collective performances of automotive forgers.

5.241 Market performances

Growth rates have been calculated in Table 37 below by first taking out inflation, based on the wholesale price index, and then calculating % growth p.a. on a simple arithmetic basis.

Table 37 Company sales growth performances by size groups

Company Groups	Sales growth 1976-1980 % p.a.	Sales growth 1980-1982 % p.a.	Sales growth 1976-1982 % p.a.
Av. group I	-4.9	-12.0	-6.8
Av. group II	-4.5	-12.3	-6.3
Av. group III	-1.0	-15.1	-5.2
Av. group IV	-2.5	-12.4	-5.5
Av. group V	-0.1	1.8	-1.9
Av. group VI	-1.8	-8.2	-2.1
Av. all groups	-2.5	-9.7	-4.6

Note: wholesale price indicies for 1976, 1980 and 1982 were 59.45, 100 and 120.1

For forging companies collectively, the decline in sales volume which had been about 2.5% p.a. in 1976-80, had sharply accelerated to just under 10% p.a. during the last three years examined. Decline has been comprehensive as in

the case of automotive bearings manufacturers.

5.242 Financial performances - returns on capital employed

Table 38 Overall performances by size groupings

Size Group	80/83 ROCE rank	80/83 ROCE 3 yr	76/79 ROCE 4 yr	76/83 ROCE 7yr	76/83 ROCE rank	76/83 ROCE ± growth	76/83 perf rank
I	16.5	0.5	19.4	11.3	16.0	4.4	17.2
II	17.3	3.8	16.2	10.9	18.5	4.6	19.7
III	19.7	-3.5	15.5	7.4	18.8	2.2	19.0
IV	25.0	-20.1	17.0	1.1	24.2	-4.4	24.0
V	14.0	4.2	22.9	14.9	14.9	13.0	11.3
VI	18.5	-15.2	17.4	3.4	20.1	0.9	19.7
All	18.5	-5.0	18.1	8.2	18.5	3.4	18.5

The collective performance of these companies has undergone a dramatic and comprehensive decline in the last three years, with average (unweighted) ROCE for all 36 companies falling to -5.0% compared with just over 18% during the previous four years. Examination of companies with longer runs of financial figures, suggests that results during this earlier period are similar to results going back to 1963. The picture, therefore, over the last three years has been one of an unprecedented decline in financial performance. Dramatically, 58% of all companies averaged losses during the most recent 3 years, whereas only one of these 36 companies averaged losses during the previous four years.

The aero sector has generally been much more profitable, which may partly explain Hughes-Johnson as the best performer (see Appendix C.2) since it is also highly involved in this sector. It also seems a factor in Firth Derihon's good performance. Oil industry applications have

also proved profitable for some companies, notably Cameron Iron. However, such sectors are clearly no panacea. Another large company specialising in the aero sector, George Turton Platts, has had one of the most disastrous performances, with ROCE averaging losses of 44% during the three year period 1980-83. (Appendix C.3 also includes details for some non-automotive forging companies.)

Thus the comprehensive and precipitous performance decline since 1979 is borne out even more starkly than in automotive bearings.

5.25 Relationship between scale and performance

5.251 Sales growth

Table 37 showed that over the longer period 1976-82, Group V performed best in terms of sales growth, and there has been a general tendency for smaller companies to perform better in terms of market performance. In the most recent three years, whilst companies in the smallest two groups V and VI have performed better (particularly Group V), there has been little difference in sales performances in the top four groups and Group III companies who had been doing well have fallen back.

Smaller companies have perhaps more scope, through improvements in market share, for weathering market decline, and companies below sales of about £1.7m in 1976-77 have indeed consistently outperformed larger companies. (This has probably also improved their profitability).

5.252 Financial performance

Figures on profitability shown in Table 38 are not susceptible to over-simplistic analysis. General notions, such as the idea that size or market share is likely to lead to superior performance clearly need to be treated with considerable caution in this particular context.

Group V, comprising the second smallest group of companies, with sales between £0.9m and £1.7m in 1976-77, again appears to have performed best over the full seven year period. ROCE's for this group averaged 14.9% compared with 8.2% for the 36 companies as a whole. The final performance indicator in the table is a composite formed by adding average ROCE and average annual sales growth after inflation. On the basis of this composite performance indicator, Group V companies averaged 13.0% compared with only 3.4% for all 36 companies.

For companies above this size range, there is some evidence that relatively smaller companies are being squeezed. The largest group, Group I, averages ROCE of 11.3% thus marginally outperforming the next largest group, Group II. ROCE performance in the next groups falls off substantially, however, with Group III averaging 7.4% and Group IV coming down to 1.1%. A similar pattern emerges on the basis of the composite performance indicator with Group I averaging 4.4%, Group II 4.6%, Group III 2.2% and Group IV -4.4%.

Once companies get above a certain size, (sales of more than about £1.7m in 1976-77), they appear to enter into much more direct competition with the larger companies, leading

to something of a "squeeze". Companies in the next size groups up then seem to fare better.

Yet the advantages of scale cannot be overriding and at some point diseconomies, perhaps arising from organisational problems, seem to take over. The sample of 36 companies excludes the GKN group of companies, with the exception of Birfield. If any group holds advantages of scale it is certainly this group, and GKN Forgings have rationalised to exploit such advantages, yet it has not performed well. Although it has weathered recent conditions a little better than average, with ROCE during 1980-83 at 2.6% compared with an average of -5.0% for all 36 companies, its performance over the full 7 year period is less good, at 0.3% compared with the sample average of 8.2%. Similarly, although due to amalgamation continuous figures were not available for Firth Derihon's equally large sister company River Don Stampings, the latter's financial performance up to that date was well below average.

With these reservations (and the sample size is quite small), the general tendency of middle sized companies to find their performances squeezed would appear to raise strategic questions for the companies involved. Many of these companies appear to be neither large enough to extract the advantages of scale on the one hand or small enough to find alternative competitive niches. They should therefore consider, perhaps quite bold, changes in direction if they are to escape a situation of being "caught in the middle". The larger ones here could consider for example amalgamation and rationalisation with other companies, moving up a rank; others might consider focusing their activities to attain

greater specialisation, even if it is necessary to slim down operations. The degree of overcapacity, which must now be expected to persist even in the longer term, suggests that fairly radical changes in direction will be needed for this group of companies, if they are to resume acceptable levels of financial performance.

The issue of scale may therefore raise strategically important questions for some companies, but such issues must be analysed in the light of circumstances and contextual evidence. The key to successful performance cannot be related simplistically to size for automotive forgers. They must be wary of relying on fairly general notions such as supposed advantages from market share, particularly if the market is interpreted on a parochial UK only basis. On average it is smaller companies who have performed best, and even in size categories where conditions do appear more difficult, some companies have still managed performances well above average. Volume-orientated strategies such as GKN Forgings' based on acquisition, integration and rationalisation to gain maximum advantage from possible scale advantages do not appear to have been successful in recent years, though they may have been more appropriate in the growth conditions of the 1950's and 1960's.

5.26 General issues related to success

Appendix C.6 orders companies in terms of their longer term performances and then provides synopses of the principal strategies they have pursued.

A number of successful companies identified distinctive

niches quite early on (eg on specialist safety critical applications); but they also displayed considerable commitment over many years in their investments and by focusing resources accordingly.

Not all specialists, though, have been so successful. Many companies, including some of the specialists, have fallen into what appears to have been something of a trap, that of simply going for volume orientated equipment. Declining business volume, and disruption in order patterns resulting in a sharp reduction in production runs, have in more recent years placed flexibility in manufacturing methods at a premium. A common progression in the past was for automotive forgers to move from traditional hammers onto presses, but in economic terms these tend to be less flexible. Ironically, recent market changes have rendered many more modern presses, even entire press shops, uneconomic. In the UK, though not in fact overseas where business conditions have been less unfavourable, there has been a drift back towards older technology, and in particular back towards hammers.

In practice however, increased focus tends to involve some sacrifice in flexibility in a more general sense and also the use of more dedicated equipment. To be successful companies have to balance the advantages of specialisation against the need to retain as much flexibility as possible in their manufacturing operations. It is possible to improve flexibility through careful attention to engineering and production matters. However the days of success just through investing in the latest type of production equipment have passed by.

It is surprising how many companies have opted for broadly similar strategies, and companies which have specialised more have often gone for similar niches. This has contributed to greater rivalry and even more intense competition. There would seem to be scope for some companies to further focus their operations, and to do so in more distinctive ways, so as to avoid quite such head on competition with other manufacturers.

It would, however, be wrong to place too much emphasis on such broad strategies being pursued by manufacturers. Appendix C.6 points to considerable overlap, with companies proving more or less successful in spite of quite different broad strategies.

Managerial commitment and attention to basics still seem to be more vital factors for success. For example, the Hill and Smith Group's two forging companies, Criterion Stampings and British and Midlands, ranked respectively 3 and 7 on performance out of 36 companies, yet their market strategies have not been particularly distinctive.

International competition has made far less direct impact on forgers than on automotive bearing manufacturers, but the subtler indirect effect has been dramatic. Profitability remained reasonable up until almost 1979 and it seemed suppliers could almost afford to ignore the problems of their UK automotive customers. At this point, as discussed in section 4, the vehicle manufacturers had to insist on a more internationally competitive service, simply to survive themselves. Larger companies, particularly those operating in volume market segments, are perhaps most

exposed to such demands, since the threat of international sourcing is much more credible than for small jobbing orders. This partly explains the relatively poor performance of such companies. Yet the change has crucially increased the importance of matching international rivals on key issues such as productivity, cost reduction, quality and flexible manufacturing systems. Manufacturers complacent in such matters have since paid a high price.

5.27 The erosion of forgers' international competitiveness

5.271 Productivity differentials

Table 39 shows productivity estimates, obtained from visiting automotive forging plants, in which data seemed more reliable. The best UK data was from <> UKF1. This plant was chosen as a particular focus for overseas comparisons, partly for this reason and partly because of its similarity to the German plant. Figures for other UK companies are segregated.

Table 39 Productivity estimates for automotive forgers

Country	Company	Employees	Tons p.a. per man	Sales p.a. £'000/man*
Japan	<JF1>	300	129	99
Japan	<JF2>	340	78	48
USA	<USF1>	370	86	80
Germany	<GF1>	900		28
Britain	<UKF1>	460	19	23
Britain	<UKF2>		23	
Britain	<UKF3>		34	
Britain	<UKF4>		34	28
Britain	<UKF5>		9	

* currency conversions at following rates of sterling: $1.5, 4DM, 400 yen.

of work done in-house are discussed in Appendix C.5, but do not explain such substantial productivity differentials between Britain and the USA and Japan.

These situations are less comparable than those discussed in automotive bearings, relating to operations of multinational companies, but they give some appreciation of the productivity gap.

Table 39 suggests that larger plant size is not a factor in the better performances of US and Japanese plants. Only a few years ago <UKF1's> plant employed over 900 people and <UKF2> plants typically employed about 1,000 people, going up to about 2,000 <>. This confirms findings in 5.25 that large size does not contribute greatly to success in this particular sector. Indeed, UK plants would often seem to suffer from being above the optimal size, bearing in mind organisational disadvantages as size increases. US and Japanese plants gained through greater specialisation, though even here some <UKF2> plants are also quite specialised.

Both Japanese plants are much more modern than those in other countries. Although the first company <JF1> was established in 1916, an analysis of the age structure of major items of equipment (weighted by tonnage capacity) produced an average age of 13.5 years in their main press shop and only 3.1 years for all their air drop hammers, producing an overall age estimate of 12.2 years. The commitment to modern technology is supported by high investment levels and also through in-house developments. This affects manning levels: eg as a result of introducing

pedal controls all their modern air drop hammers are now manned by single operators. The plant belonging to the second company <JF2> was completed in 1976.

In 1968, the first company's plant was visited by the US company's present plant manager. He was immensely impressed by the modern equipment, but found the Japanese were considerably behind in terms of production experience. Since then experience effects, supported by impressive commitment in the area of production, have enabled the Japanese to catch up and surpass Western standards. Such investments are still continuing and the Japanese seem likely to move even further ahead.

Japanese investment levels are assisted by a dynamic and competitive customer industry base, allowing them to modernise whilst increasing capacity to meet demand. Their lower cost of capital enables them to consider payback periods as high as 10 years, which is unacceptably high for most British or American forgers, particularly given recent interest rates.

British plant is generally considerably older, with much equipment over 50 years old. Disturbingly UK conditions have penalised companies investing in more progressive processes. This is partly because modern equipment is more volume dependent. Yet Japanese engineers and executives were astonished to hear of the general drift back towards traditional hammers in the UK. This suggested UK conditions encouraged technological regression: hammers, apart from representing a step backwards, were considered to hold very little scope for further technological development. For example, robotic arms can now be used on

presses but not on hammers. Equipment such as presses did present greater problems in respect to flexibility, but was (the Japanese argued) the only way forward in the context of technological developments taking place. However, from the viewpoint of UK manufacturers facing such conditions, the fact that companies employing old fashioned equipment frequently outperform companies such as GKN with much more modern equipment, suggests that it would be unwise to place undue emphasis on differences in plant and equipment.

Even given good equipment, progress on manning levels depends upon everyone being determined to develop and maximise its potential usefulness. I was impressed by the Japanese emphasis on targets everywhere. For example the target output for a 1600 ton press, manned by just a single operator, was 340 pieces an hour, reflecting a more general target of 1.5 kg/hour/man. The chalked up average actual performance for the day prior to my visit was 448 pieces an hour. Similarly down time targets were also proving effective. I found down time on one 3 ton hammer, for example, had fallen from 8.5-9% in 1977 to 4.5-4.7% in 1982.

General business conditions do matter too. UK economic conditions have reduced capacity utilisation to well under 50%, and are also discouraging people's efforts in this direction. Labour productivity would also rise if capacity utilisation improved, since staff numbers in some areas are fairly invariant. The US company's productivity has also fallen, despite considerable efforts, because of falling capacity utilisation. In 1978 output per man appeared to have been almost 100 tons/man.

It should, however, be noted that there was less evidence (if any) of any productivity gap against the German manufacturer <GF1>, whose plant and equipment were also fairly old. It should also be appreciated that the company is reputed to be a less formidable competitor than other German forgers, such as Gerlach, with more modern equipment.

In conclusion a very substantial productivity gap has emerged between UK forgers and those in Japan and the USA. The fact that at least one major UK forging company <UKF2> once enjoyed a reputation for much better efficiency than manufacturers such as the Japanese only adds weight to concern. Part, though not all, of the problem is the UK's exceptionally unfavourable business environment. This has discouraged investment and led to stagnation, whilst rivals such as the Japanese are moving swiftly ahead.

5.272 More flexible manufacturing methods

US productivity appears to owe a great deal to longer production runs, which are now typically between 5,000 and 15,000, with most about 8,000-10,000, and going up to about 30,000 on better selling lines. As <USF1's> in-house facility, the US plant is in a better position than most US forgers.

Significantly, this US advantage has been sharply eroded. Two years ago, this US plant could choose a good deal of its business allowing production runs of about 30,000 or above. Orders have fallen, but production runs have fallen considerably further, because vehicle customers are now in a much stronger bargaining position and (like others) they are insisting on a much more flexible delivery

service. Japanese production runs are lower, typically about 4,000, though European figures are lower still, and disruption affecting UK production runs has been quite exceptional.

Japanese forgers, however, have had to learn how to handle relatively low production runs in order to comply with just-in-time programmes instigated by their vehicle customers over 10 years ago. As a result of numerous incremental changes in production methods, they have radically reduced both changeover times and overall factory through times.

Table 40 Changeover times in Japanese forging plant

	Changeover 4 years ago	Changeover times now
2,500 ton forging press	30-45 mins	15-20 mins
2,500 ton friction press		15-20 mins
1,600 ton forging press		12 mins
25 ton-M Counterblow hammer	60-90 mins	30-40 mins
2,000 ton upsetter	Up to 3 hrs	50-60 mins
3 ton hammer	50 mins	15-20 mins

Crews involved on changeovers comprised 4 men on the large 2,500 ton presses, 2 on the 1600 ton presses, and 7 on the Counterblow hammer. Many small teams, comprising people temporarily drawn off the production line due to below capacity working, were constantly involved in timed training exercises to reduce times even further.

Output rates on lighter forgings such as conn rods were running at 690 / hour (1.5 ton hammer, using 2 operators). With production runs now below 4,000 on many items, Japanese manufacturers understandably claim changeovers as frequent as 4 or 5 times a day on many jobs. Output rates on heavier

forgings such as front axle beams are much lower, but here die life can fall as low as 700 - 800 pieces, so there is still a problem of fairly frequent changeover. Manufacturers have thus been forced to radically improve changeover times in order to avoid excessive down time.

Western manufacturers are well behind in such developments, particularly the Americans cushioned until recently by good production runs.

Table 41 US changeover times on forging plant

4-5000 ton hammers	2.1 hrs set up	+	0.7 hrs out	= 2.8 hrs
1.5 - 3,000 " "	1.8 hrs set up	+	0.7 hrs out	= 2.4 hrs
General hammers	1.9 hrs set up	+	0.7 hrs out	= 2.6 hrs

The Americans have now recognised that conditions, even for them, have changed and have plans to cut times down to 1.25 hours, using a block die concept.

Despite particularly severe problems in this respect, I found scarcely any evidence of UK forgers pursuing such programmes on any systematic basis.

5.273 Other production issues

At the heart of such progress on numerous production matters seems to be a recognition by senior Japanese management of their strategic significance, and a commitment where necessary to long term improvement programmes. Their strategic thinking places due weight on the highly specific, often quite technical issues involved.

In contrast to sophisticated financial plans, characteristic of some UK companies, one Japanese forging company's "strategic plan" comprised a single technical drawing. Beginning with small pie charts indicating market

share targets, this plan rapidly moved into highly specific technical and production targets. Their control systems reflected these targets, and relied on numerous simple performance charts, which were highly visible, readily comprehensible and ubiquitous in all production areas. Quite specific targets in the "strategic plan", such as flash reduction, were actually implemented: from 5.25 kg to 1.87 kg in the case of one axle beam.

Implementation, in this example as in other production matters including quality improvements, relied heavily on numerous highly committed groups of production workers, often referred to as quality circles. These production groups received close attention and support from top management.

In return for flexibility and commitment, production personnel received from top management not only job security (lifetime employment surprisingly appeared to be the norm even in quite small supplier plants), but also recognition of the strategic importance of their contribution. In comparison to UK competitors, they were treated as "king pins" and their morale was correspondingly much higher. More reliance was placed on those lower down the organisation, as compared to staff functions, and the approach was (necessarily) associated with a better industrial relations climate.

Thus to be effective, strategies need to pay commensurate attention to such production matters. Commitment to longer term improvement programmes seems to be essential, and may have to entail improvements in the

industrial relations climate and moves to a more production-centred organisational focus.

5.274 Comparative cost levels

Steel costs within Europe are largely controlled by EEC agreements. In 1981, British forging prices averaged £968/ton and steel costs were estimated by one company at almost exactly 50%, implying their steel price was approximately £480/ton. In the same year, Tokyo Drop was paying about Y 0.13m or about £325/ton, converting at the then rate of around £=400 yen. This comparison is clearly sensitive to trends in the real exchange rate. UK and other European forgers are clearly squeezed by powerful customers on the one hand, and bureaucratically established steel prices on the other.

Labour cost trends for forgers in the main competitor countries are graphed in Appendix C.4, although they are less up to date than those discussed in the case of manufacturers generally in the next section (these also being graphed in Appendix D.5). It is clear that UK labour costs moved sharply against trend after 1979. This seriously damaged the international cost position of UK forgers, at precisely the moment when UK vehicle customers had to insist on greater international competitiveness.

Average remuneration paid by UK forging companies was allowed to rise from £3,500 in 1977/8 to £5,000 in 1980/81 and £7,000 in 1982/83 (ICC Business Ratio Reports, 1984 and 1981). In the context of monetary restraint, this has damaged the competitiveness of UK forgers.

5.28 GKN's strategy in automotive forgings

5.281 GKN's dominant historical position

About 25 years ago, GKN Forgings was highly competitive internationally. The UK automotive forgings market was still large and dynamic. The UK forgings sector also gained greater volume through being relatively independent of vehicle customers.

GKN's forgings strategy had been built upon volume orientation. Its acquisition strategy had culminated in a greater market share than overseas competitors enjoyed. Plant sizes were particularly large. Their largest forgings plant Garringtons produced 128,000 tons or almost 20% of total UK production and was larger than any in Europe. Production methods were geared to volume runs, and involved a high proportion of modern volume orientated equipment. In the 1950's, Garringtons' press shop was a world showpiece, much visited and photographed by people from all over the world (not least the Japanese).

As UK market leader, GKN Forgings' product range was also the most comprehensive nationally, and probably internationally too. They maintained a strong technical capability. Between 1960 and 1965 R & D averaged 0.44% of sales, which was above the industry average, and the company played a leading role at technical conferences both nationally and internationally.

The success of this strategy owed a great deal to the entrepreneurial flair and competitive commitment of executives such as Lord Brooks. In the context of growth

the approach corresponded to UK vehicle customers' requirements at that time.

Basic production matters were not neglected. Senior management were allowed considerable free rein, owing to the parent company's loose (though financially supportive) organisational structure. The philosophy of decentralisation in respect to plants (these actually competed against each other in some cases) extended to the situation within plants. Considerable authority was delegated down to production management, though they received substantial top level support, chief executives such as Lord Brooks being exponents of "management by walking about".

Industrial relations were handled through a combination of paternalism (eg better treatment for those who had served the company longer, with the idea that they in turn would pass on the benefit of their experience to others) and tough-minded attention to the importance of precedent. In a move reminiscent of the breaking of the Nissan strike in the late 1950's, Lord Brooks broke a major strike and only re-recruited those he wanted back. This secured the principle of fairly efficient manning levels (supported by piece work incentives), and in fact a more healthy industrial relations record thereafter than was common in UK industries generally.

At this time international trade, though increasing, still made little impact. GKN Forgings' direct exports accounted for 3.7% of sales in 1965, about double the proportion in 1960, having increased considerably in 1964-65 particularly to EEC and EFTA countries. The parent

company's average export ratio was higher at just over 8%, but trade in forgings was inhibited by a combination of tariff barriers, high transport costs and the close liaison between forging companies and vehicle customers (especially overseas). For automotive components in general the GKN Group tended to see manufacturing overseas as the best way to compete more internationally; but in forgings technological change had opened up fewer market opportunities in comparison to constant velocity joints, in which they held powerful patents. Volume advantages were also less appreciable. GKN Forgings therefore limited its international strategy to a policy of gradually increasing exports, but its international position was no weaker than that of overseas rivals, none of whom adopted more ambitious international policies.

5.282 Seeds of complacency

Yet already by the 1960's there were incipient signs of complacency, which were later to cost the company dear. Gradually a more "scientific" approach to management was introduced and some degree of entrepreneurial commitment which had hitherto characterised the corporate culture may perhaps have been lost.

Industrial relations was still a thorny problem. The company gradually shed paternalistic policies, which had encouraged employee loyalty; yet it ducked the issue of how to sustain employees' total commitment. Management and unions alike exploited negotiating opportunities created by the business cycle, myopic to the need for a longer term

partnership. The development of the personnel function did little to rectify this and may have reduced the authority of production supervisers at the sharp end.

Both sides then found themselves pressured into allowing important production issues to become the sacrificial lamb in this quiescent battle of attrition. With order books reasonably full, and unions in a strong negotiating position, management allowed an ultimately disastrous set of precedents to take root.

Managerial pressure on productivity eased off, just as new payment schemes, replacing piecework, reduced individual incentives. Increasing attention to work study did little to assist, since the problem was embroiled with industrial relations issues.

As competition in general increased the parent group tightened its structure, with Forgings becoming a "Sub Group". Staff functions such as finance increased in importance, as budgeting systems enabled the parent group to apply greater pressure for results. A new phrase, "the bottom line", carried increased influence in strategic decisions taken at higher level.

Inflation accounting increased awareness of the need to restore profitability; but attempts to raise prices foundered. Competitors, many with less sophisticated financial approaches and depreciated plant, benefitted from some alleviation in competitive pressure but felt no necessity to follow suit on prices. Having not first addressed fundamental competitive issues, such attempts did not succeed in raising profitability.

The extension of GKN's acquisition strategy, with the

takeover of Ambrose Shardlow and Birfield Extrusions, had increased market domination; but any gains in negotiating power that might have been hoped for (eg monopolistic pricing) were eroded when vehicle companies' bargaining positions later strengthened substantially. Indeed, the strategy may have diverted attention and resources from the production area.

Momentum was sustained in R&D, redesignated as "Process and Product Development" to preserve the emphasis on "development". This produced a number of practical technical innovations, many well ahead of Japanese rivals even in 1983, but much of this effort was wasted. <> There was a lack of commitment by senior management and unions to getting new processes into production which was matched by many in production management. <>

Efforts by such staff departments were almost bound to be swamped without greater support in production areas. But as staff functions had increased in scale and importance, relationships between production staff, senior management and other staff became less continuous; morale in production management suffered as they felt by-passed, and resentment led to a backlash. <>

Over-manning was recognised. The relative ease with which full production levels were sustained during the three day week in 1974 was one demonstration of this. Yet fear of expensive strikes on the one hand and pressure for rapid improvements in annual operating results on the other, led to management being unprepared to grasp the nettle until competitive conditions got much worse. The same applied to

wage awards.

5.283 The need for a change in strategy

Having inherited a competitive advantage, the company had effectively allowed this to be squandered through complacency on basic matters of critical importance. Yet there was also another strategic problem.

GKN Forgings' competitive advantage had lain in volume orientation, but (as has been argued) such benefits were relatively small in this components sector, and any margin for complacency narrow. There was therefore always a danger in trying to dominate such an inherently fragmented sector, relying on volume benefits, technology and vertical integration back into steel (see for example the demise of Prelude described in Porter, 1980). Family firms operating with depreciated equipment created exit barriers. Competitors could also switch with ease from other forgings segments back into automotive work the moment conditions improved. As growth tailed off and overcapacity grew <>, volume orientation became a liability.

Second, GKN Forgings' volume automotive markets, with better technological opportunities, became subject to increased European competition. By 1981, its own export ratio had increased to 17%, with 69% of exports going to Europe. Direct competition is still restricted to imports and any import threat is limited by the lack of attractive technological or marketing opportunities. Even so it is increasing, whilst GKN's attempts to penetrate Europe are hampered by much closer ties between forgers and vehicle customers there. Its early advantage as a result of the UK

sector's relative independence from vehicle customers seems to have become a liability: as in automotive bearings international competition is asymmetrical, since UK vehicle customers are more "open" to international suppliers than overseas customers. Virtually all GKN Forgings' "mobile equipment" customers had by this time developed international procurement operations, and the impact on profit margins was considerable.

Squeezed by international competition on the one hand and intensified domestic competition on the other, GKN Forgings' negotiating position against vehicle customers was undercut. Like the US plant, GKN also found it could no longer rely on volume production runs. Destocking also increased disruption in vehicle company order schedules.

Thus GKN's relatively poor performance in the sector can be ascribed to insensitivity to its changing strategic context: its over-reliance on volume orientation, exacerbated by underestimating the effects of European competition on this strategy; a lack of sensitivity to the implications of changed customer needs and lower growth conditions; and (partly as a result) complacency it could not afford on more basic issues such as productivity and flexible manufacturing systems.

Its main adjustment strategy in recent years has been retrenchment and cutting employment back into line with output. Output almost exactly halved between 1973 and 1981. Employment in 1979 was 10,000, only slightly lower than in 1973, but was sharply reduced to 6,000 by March 1982. The company estimates it could meet an additional 50% rise in

demand without the need for additional labour, so its main hope is for some restoration in demand. The full benefits of efficiency improvements will not show up until then, but the company anticipates a return to moderate levels of profitability (ROCE levels are hindered by the fact that only half their "capital employed" is actually in use).

The cost of decline has been high in financial as well as in human terms. Apart from redundancy costs, asset write-offs were considerable. <>

The same closure also demonstrates a reluctance, rooted in a corporate culture more appropriate to past conditions, to move away from an undue reliance on large scale plants. <> Capacity had to be cut somewhere and F & P's work was transferred to other larger plants, hungry for business; yet this analysis suggests that, given continuing overcapacity, it might have been better to transfer work away from large volume orientated plants to smaller more flexible operations.

To summarise, GKN's volume orientated strategy has been undermined by changing competitive circumstances, particularly the increased impact of international competition in its chosen market segments. It has also suffered through neglecting matters in production, an area of strength in the past.

5.29 Conclusions

As in automotive bearings, UK manufacturers in this sector have undergone a remakably severe and comprehensive performance decline in terms of sales and profits. Again this appears to reflect an underlying problem of UK

competitiveness.

A problem affecting UK forgers particularly has been the comprehensive phenomenon of decline in so many customer industries. This UK sector has been part of, but has also contributed to, this phenomenon since its own international competitiveness has been allowed to decline. From a position well ahead of rivals such as the Japanese 30 years ago, it is now well behind on issues such as productivity. Despite some improvements, it is still falling back in relative terms. Had this sector been able to provide the more internationally competitive service which vehicle and other customer industries (themselves under international pressure) can now insist upon, performance decline would have been less severe and prospects brighter.

The UK's exceptionally unfavourable business environment has however been partly to blame. Wage cost pressures have damaged competitiveness. Investment in more progressive technology has been discouraged, and massive underutilisation has led to stagnation. The direct impact of overseas competition has been less important than in automotive bearings. Trade, though increasing, has been inhibited by the product's higher transport costs and the need for fairly close customer links. More importantly, there has been less scope for technological and marketing opportunities and benefits associated with volume production are also much lower for this product. Even so, the trade position has declined and direct competition (particularly from Europe) is now significant strategically in volume market segments.

UK manufacturers have exacerbated their difficulties through not being sufficiently sensitive to their changing strategic context. Many appear to have overestimated benefits associated with volume-orientated production methods, particularly given the customer needs and the general business climate. Even in market segments where volume benefits are more pronounced, these have been offset by the increased impact of direct international competition.

UK manufacturers need to establish a closer relationship with UK customers. In the past the sector may have benefitted from a relatively independent position, but surprisingly this is no longer true. There is a limit to the reliance that can be placed on export customers, especially if UK conditions do not become more favourable, and there are many areas in which it is important that UK suppliers and their UK customers support each other. However, there is substantial scope for technological transfer agreements especially with Japanese manufacturers.

UK manufacturers need to be more sensitive to the strategic implications (in their particular situation) of fairly basic production issues, such as manning levels and flexible manufacturing systems. They also need to be prepared to change organisational and industrial relations approaches to support efforts by production personnel.

Decline in this sector is likely to be less dramatic since international trade is relatively low; but the high price paid for decline in financial and human terms, make it in everyone's interest to coordinate their efforts, in a more committed manner, to prevent this situation recurring in the future.

5.3 Automotive Instrumentation

5.31 The market for automotive electronics and instrumentation

In comparison to other component markets, Lucas 1983 review could justifiably claim, "Few other market sectors offer such glittering prospects". The value of an average European car's electronic content, only £1 in 1970, had risen to £25 by 1982, and was independently forecast by the Bureau d'Information de Precisions Economiques to rise to £150 - £175 by 1990 (quoted in Lucas 1983 review). Accordingly the West European market for such automotive electronics was expected to grow 30% p.a. from an estimated value of £250 million in 1982 to a projected value of £1.5 to £1.75bn by 1990. Similar arguments are expressed, from a more independent viewpoint, in Electronics (26.1.84).

Also in contrast to other component sectors, UK electronic component manufacturers generally have been consistently profitable. ICC average sector figures for the largest 60 companies for the years 1980, 1981 and 1982 for ROCE were 25%, 25% and 23%, and for profit margins 9.2%, 8.6% and 8.2%.

Other major world markets appear even more dynamic.

Table 42 US and Japanese automobile electronics markets

	1982	1983	1984	1987
	Estimates		Projections	
USA ($m, constant prices)	1693	1932	2086	2588
Japan ($m, converted at $=Y238)	1122	1330	1564	-

Source: Electronics, 12.1.1984

Citing Ford, the same article noted, "Between 1970 and 1980 the electronics content per average US vehicle

increased from about $25 to $250 ... Within 10 to 15 years it should approach $1,400", and predicted a world market over $14bn by 1990. This is reasonably in line with my own interview findings. <>

5.311 Market segments

Historically the involvement by vehicle manufacturers in electronics (apart from radios) dates back to headlight controls in the 1950's, followed by voltage regulators and alternators in the 1960's. By the end of the 1970's about thirty different electronic items were identifiable and the major segments now recognised began to emerge. In the last few years the number of new items has mushroomed so it is important to appreciate the pace of change reshaping market segments.

Table 43 Main automotive electronic market segments
<>

Underlying such opportunities has been the development of integrated circuits in the late 1950's, followed by very large scale integration (VLSI) and more recently by microprocessors. The market for integrated circuits and transducers alone is sizeable <>. It is particularly important in respect to automotive instrumentation, the area that because of its potential will be the focus in this study.

Bob Schultz, Chief Engineer, Buick Motor Division at General Motors, has suggested (Electronics, 26.1.84) that a future scenario in about 1990 would have to allow for whole ranges of completely new electronic products: keyless

systems, automatic seat and mirror adjustment, navigation and other information systems, trip reports, moisture activated wipers, replacement of throttle cables, radar-assisted braking systems, ride controls, energy management systems, diagnostics. Vehicle manufacturers' motivation is partly the opportunity for product differentiation presented by such developments, though Ford is a little more sceptical about "razzmatazz applications"; but it is also founded on solid grounds such as cost reduction and reliability, particularly in the more basic areas. Quality is now so high in some areas as to eliminate the need for quality checks. Unit costs of electronic parts have already improved by a factor of about 100, according to Schultz, and their reliability by about 200.

The pace of technological progress and market development in Western Europe, though impressive, has however lagged behind America and Japan. Within Europe, moreover, the UK market has not escaped entirely the dramatic downturn experienced by other component manufacturers.

The UK original equipment market for instrumentation, including transducers, was worth <>. In 1982 compared to expectations <> this market had slumped back in real terms <>, producing quite considerable overcapacity, prior to rationalisation.

Whilst Lucas' optimistic projections for the West European market seem not unreasonable, the scale of their optimism ought to be tempered by the relatively flat performance of the domestic market to date at least. UK

manufacturers' export ratios in automotive instrumentation have fallen back <> reflecting therefore only a small share of markets in mainland Europe.

Thus even in such an exceptionally attractive sector, there are incipient signs of UK decline.

5.32 Internationalisation of the market and competition

Prior to entry into the EEC, tariff barriers encouraged close links between suppliers and assemblers. There was little inter-European trade in instrumentation, and the pattern of competition was primarily national and monopolistic. In the UK, Lucas tacitly agreed not to attack Smiths' virtual monopoly, in return for Smiths holding back in other markets, and a similar stalemate in Germany kept Bosch from attacking VDO's virtual monopoly.

Ford and GM were content to use national independent suppliers until the end of the 1960's, when they shook up the pattern of competition by introducing their own in-house suppliers. Only about 5% of Ford's business (essentially transducers) is now open to independent UK suppliers, the rest being supplied on a European basis by Autolight, "in-house". GM business tended to be increasingly controlled though Opel in Germany, with about half supplied by their in-house supplier AC Delco in the UK, and about half "open" and in fact supplied mainly by VDO in Germany. With the decline of GM's UK business, AC Delco is pressing for more of VDO's business to fill its own capacity.

Table 44 Major European instrumentation manufacturers

Britain	Germany	France	Italy	Ford	GM
Smiths	VDO	Jaeger	Veglia	Autolight	Delco

As in other components, Europeanisation has been encouraged by trade liberalisation and customer requirements, but here even more than in the case of automotive bearings, the change in technology from electro-mechanical to electronic processes of production has transformed the pattern of competition.

This change has reduced entry barriers and attracted powerful competitors with no substantial previous instrumentation involvement. Lucas and Bosch (from Germany) and other "systems" companies have entered, recognising the future need for integrated electronic packages involving instrumentation, such as engine management systems. The investment stakes are set to increase beyond what weaker instrumention manufacturers can afford. Motorola (USA)'s chief executive has remarked (Electronics, 26.1.84) on the "sky rocketing" costs on the integrated circuits side: £40m by 1981 would scarcely finance one processing bay, whereas just a few years before "it would have put you in business". This will lead to further industry consolidation and rationalisation, and makes the UK market base with sales of £20m p.a. look too weak to sustain manufacturers in the longer term. Other new entrants are electronics companies such as Motorola who have now established an automotive division. The change in the pattern of competition is similar, in some respects, to that taking place in the watch industry, with experience effects likely to be important.

Automotive instruments, though, tend to be highly customerised, if not almost fashion products because they are used by vehicle manufacturers as a means of differentiating their vehicles. More standard electrical items such as alternators and starter motors have already been savaged by Far Eastern competition, but other customerised electrical products such as interior lighting have been less affected. Similarly, automotive electronics are differentiated from other consumer electronic markets because of the need for close customer liaison. Systems design involvement is considerable and component development must be matched to customers' model development programmes. Also, quality and delivery requirements dictate considerable conservatism, so that the pace of change will be slower than in other consumer electronic markets. The effect will be to encourage closer supplier/assembler relationships and to inhibit the pace of internationalisation.

Investment requirements are, however, encouraging vehicle manufacturers to rely more on independent suppliers and this is weakening the position of UK in-house manufacturers such as Autolight. Yet customer ties are still important. Jaeger is owned equally by VDO and Plafinco, which is controlled by Matra, and is closely linked into Renault. In Italy, Veglia is owned by Borleti, in turn owned by Fiat. Fiat's unions oppose imports of UK parts. Thus although competition is becoming more international, it is perhaps naive to think in terms of free market competition.

In-house production accounts for almost 100% of the US market compared with 70% or so in Europe. GM is served by AC Delco, Ford by Autolight, and Chrysler by Huntsville.

The only sizeable US independent is Stuart Warner which specialises exclusively on trucks. This is a major factor inhibiting European entry into the US market - only VDO has a manufacturing presence there, having established an operation in support of VW's US plant.

In Japan Toyota owns Nippon Denso, which also manufactures other electrical parts, and Nissan owns Kantoi Seiki (instrumentation only). There are a number of independents such as Hitachi, but supplier/assembler relations are extremely close.

British exports are now predominantly to Europe <> though there is also some involvement with India and Korea. Thus initially, from a UK standpoint, Europe will be the major battleground as international competition intensifies. UK manufacturers accept that they now have to operate on a European basis if they are to survive, but arguments expressed by some, that multi-sourcing should ensure UK manufacturers a reasonable share of the European market, are unconvincing. Even the No. 2 in the US electronic calculator business, Bowmar, filed for bankruptcy after intense competitive pressure from Texas Instruments in 1975 (Hedley, 1976a). Competition in instrumentation may be less extreme for reasons already outlined, but there is little room for complacency, particularly in view of UK manufacturers' weak position in mainland Europe.

Opinions differ on the question of whether the pattern of competition may even become "global" as has happened in motor cycles, watches and consumer electronics. Some claim Ford, whilst insisting on competitive standards against

alternative European sources of supply, does not require UK manufacturers to compete with costs available from Japanese suppliers. The argument continues that European governments would protect such an important industry at some point. Yet other factors are drawing world markets closer together. Instrumentation is closely linked with vehicle engines, which are supplied on a highly international basis, particularly now that engine sizes are more similar. Model types and vehicle technologies are also more similar following the drive for fuel economy, resulting in parallel pressures on component suppliers. Also although customerisation is important, the basic systems requirements for instrumentation are quite similar worldwide.

There are already important linkages taking place. <> More expensive instruments, incorporating a higher degree of technology, are the first to be affected. Electronic display systems range enormously in cost from about £8 to £125, making it worthwhile shopping around for the world's best products for luxury cars such as Jaguar, Mercedes and BMW. Much simple non-electronic instrumetation equipment will though continue to be made on a more local basis for some time to come for reasons of cost.

My interviews with Japanese companies suggest that while the immediate competitive ball game is certainly Europe, this is unlikely to be the case in the longer term. So far, Japanese export ratios have been low because of close customer links, only about 6-7% for one company visited and fairly negligible for the other. However, one company expected its export/sales ratio might rise to 40-50% in the next five years. Technical links are already

established, for example Bosch and Lucas have sent director level delegations to Japanese companies and have numerous technical agreements. Japanese manufacturers already have European sales bases (though they have met stiff resistance in Germany). They also have overseas plants, but their major first target is undoubtedly the USA, where Nippon Denso for example already has a plant for vehicle conditioning equipment.

The Japanese do appear set to gain considerable "experience" advantages from volume. One manufacturer, currently producing <> a new type of pressure sensor, projected perhaps a hundredfold increase within the next 5 years <>. Japanese companies did see a pattern of competition developing along similar lines to calculators and watches.

In respect to Britain the close BL/Honda link and the Nissan company coming to Britain must present an added attraction. BL does receive some emission control parts from one Japanese company but the amount is small and they have found BL difficult to penetrate, to date at least.

Both Japanese and US suppliers benefit from domestic vehicle industries with reputations for being dynamic in respect to electronics. (For example, European assemblers were much slower in introducing electronic clocks). Both are also reputed as being more prepared to pay for additional sophistication.

Interestingly, Ford UK who are reputed to favour simplicity, have just rejected a technically advanced Japanese liquid crystal display, in favour of a cheaper

European model about half the price. The Japanese are so far producing only small numbers <>, but are very conscious of the experience effect. As volume grew, they expected costs to have halved within 3 years <>.

The example casts an interesting light on the claim that US multinational vehicle assemblers do not require UK manufacturers to compete on price with Japanese competition! The case of bearings also casts doubts on the ability of European governments to intervene in time to adequately protect manufacturers from Japanese competition, and instrument manufacturers themselves appeared to have some doubts in this respect.

To summarise this section, the immediate competitive battleground has now become Europe with companies such as Bosch <> and VDO posing the major threat. In the longer term however, although Japanese attention is initially targeted on the US and at the upper end of the market technologically, it seems highly optimistic for any British supplier to believe they will remain sheltered from a more global struggle.

5.33 Performance of UK manufacturers

Smiths held over 90% of the free UK market for instrumentation until it joined forces with Lucas in 1983. The company's overall performance between 1970 and 1982 was well above average for the sector at 18.6% ROCE. Sales grew at 7% p.a., after inflation, between 1975 and 1981, also well above average. Yet its good performance is large due to non-automotive activities such as aerospace. These represent more attractive opportunities than automotive work, which

has shrunk proportionately. Its automotive electronics activities generally are very small in relation to Lucas and international competitors.

In the context of factors discussed in the last section, Smiths has been wary of investment levels needed to maintain its position, given the demands associated with growth and the change in technology. From a strategic point of view something had to happen. Smiths (like Lucas) recognised that competition was set to intensify on a European, if not global, basis. <> Joint operations with Lucas on instrumentation have emerged as a possible answer. Sceptics might see this move by the two companies as primarily defensive, and designed to stem an otherwise inevitable outbreak of fierce domestic competition.

Instrumentation has proved more attractive than other automotive component sectors. Smiths have been assisted by a rise in content per vehicle <> since 1972 and by exports then negligible and now 25%. However sales of instrumentation <> have declined in volume terms. Disturbingly, from the viewpoint of the UK's competitive position in this sector, Smiths' export ratio in automotive instrumentation, having climbed steadily up to 35% in 1979, has slumped back to 25% following the rise in the real exchange rate. Closures and rationalisation, following the establishment of the joint operation with Lucas in 1983, do not merely represent elimination of duplicated resources, since in instrumentation there has been limited overlap. They also reflect a recognition of over-capacity and retrenchment brought about by the UK's weak international

position.

Lucas, like Smiths, can call on substantial, relevant technical expertise from other activities such as aerospace. Like Bosch though, its main strength lies in being able to offer the wide range of automotive electronics, necessary on systems such as those required for engine/transmission management. For Lucas, instruments therefore became attractive complementary products to their own. Also since their scale of involvement in automotive electronics was much larger than Smiths', they could feasibly contemplate the level of investment and resources that would ultimately be involved.

Yet although benefits associated with volume are particularly high for this product, scale on its own is no guarantee of competitive success in the fast moving world of electronics. Lucas' general performance is not encouraging. Following two years of expensive retrenchment, the company has commendably turned around financial performance in 1984. However over the longer period 1970 - 1982, ROCE averaged 5.7%, below average for the automotive components industry and well behind Smiths. In the context of inflation and interest rates prevailing, investors could have done far better elsewhere. Sales growth between 1975 and 1982 was also poor, both absolutely (after inflation) and relative to other component firms. Indeed, as one of the five largest component companies Lucas is a reminder that sheer size correlates badly with performance in this sector.

The company is strong in some key technological areas, such as brake systems, harnessing and fuel injection systems. Its advanced microjector was sufficiently ahead to

penetrate the US market, although even here unexpected set-backs in the diesel engine market have forced Lucas to retrench, closing down their Sunbury factory.

Lucas Electrical Division's performance has been particularly poor, squeezed between powerful European competitors such as Bosch and low priced Far Eastern competition. More standard "finished" electrical products, such as alternator starter motors appear to have somewhat buckled under the full weight of global competition, leading to heavy retrenchment - a disturbing indication given increasing internationalisation in automotive electronics.

Lucas utilised its financial weight in attempting to establish the position of its electrical division in mainland Europe by buying a 50% share of Ducellier in France; yet <>, Lucas has finally had to pull out, surrendering an important manufacturing base on the mainland. Given the "ties" that still exist, this will prove a very serious weakness in Lucas' attempt to establish a competitive position in European automotive electronics.

One electronic product that has already become exposed to more global competition, the car radio, suggests room for concern over the UK's competitiveness. As the exchange rate soared in 1980, Smiths finally abandoned this price sensitive market in the face of Japanese competition. Lucas fared little better in this product. Ford switched to Germany's Blaupunkt, whose radios as Beynon (1984) has pointed out are substantially manufactured in Korea.

Thus whilst Smiths performance has been extremely good as a whole, its position in automotive instrumentation was

too weak to cope with such a fundamental change in the pattern of competition. Lucas' overall performance has been poor, but in automotive electronics it is extremely powerful and has a great deal to contribute in any joint venture, in the context of changes which have taken place. There are signs of weakness in terms of international competitiveness and a critical problem appears to be the lack of overseas support.

5.34 The Lucas/Smiths joint operation

The Lucas/Smiths joint venture does offer real and immediate opportunities for synergy, but will probably create only a temporary respite unless accompanied by substantial strategic moves in the future. Cynically, the main immediate advantage for both companies is avoiding otherwise inevitable head-on competition in the home market. Yet as with tariff barriers, reducing domestic competition can provide only temporary cushioning against the effects of international competition. Britain's preoccupation with domestic mergers in the face of strategic problems, has generally not proven highly successful, as was illustrated in the case of automotive bearings, where internationalisation occurred earlier.

In the past, Smiths avoided such precedent and resisted linking up with Lucas. Instead, its links with Bosch and other overseas companies offered an alternative route. Even if future competition were to remain essentially Europe, some would have argued that linking with Bosch, who had a similar interest in acquiring instrumentation expertise, would have offered the more important advantage of a strong

manufacturing base in mainland Europe.

Others, taking a yet more global view, suspected that Europe was now sufficiently integrated for an export-only policy to be sufficient within Europe, but pointed to the need for a competitive grouping strong enough to survive US and Japanese competition. This scenario called for a powerful European grouping, ultimately to be supported by a major foothold in at least one of the other two major markets. As global competition increased, other weaker participants, <> would be more likely to be squeezed out.

Evidence, discussed in the last section, veers towards the latter view, at least in the longer term. Yet, on either scenario, a merely nationalistic and defensive merger will not be enough to sustain a credible future competitive position. The real potential for this particular venture may however be realised if it is used as a springboard for aggressive international moves in the future.

5.35 The UK business environment

On recognising the need for major structural change in 1980, both companies approached the government for assistance to support a new strategy for the industry, but felt they "came up against a brick wall". At the same time, the French government responded to the opportunity presented by automotive electronics. Displaying understanding of the problem's international dimension, they provided funding support but on the basis of international integration, Matra being encouraged to link up with Germany's VDO to form Jaeger. Timeliness, in such a fast moving business

situation, is important and in Britain almost three valuable years were lost before any strategic response was forthcoming, and even this appears nationalistic and defensive rather than any final long term answer. The Ministry for International Trade and Industry in Japan appears to have close long established involvement with component manufacturers and a good reputation with these companies.

Subtle pressure applied by the French government, who are not so naive as to imagine that international competition is totally open and free in this business, effectively neutralised Lucas' Ducellier foothold in France. This move, drawing little British response, has substantially weakened the competitive position of UK manufacturers. In Germany, GKN was similarly frustrated by the legal system from acquiring Sachs which would have given it some foothold on clutches.

Both Lucas and Smiths found their competitive position damaged by the rise in the real exchange rate in 1980, and as mentioned this has done permanent damage in the case of more exposed products. Both though see their competitive position as part and parcel of a more general collapse of manufacturing in Britain. A strong and steadily growing domestic market base will be important if they are to keep up with technological change and experience effects enjoyed by more dynamic competitors overseas. UK business conditions have not been favourable either to themselves or domestic customers, either in terms of the market or relative costs.

Finally, there is concern that the education system is not supplying enough electronics engineers. By contrast

Japanese automotive electronics manufacturers enjoy strength in depth in this area: 100 of 512 employees at one Japanese plant visited were engineering graduates and of these 50 had graduated in electronics.

The government is primarily responsible for action on such matters, but the crucial issue of cost pressures depends also on cooperation from employees and their representatives.

5.36 Relations with vehicle manufacturers

Manufacturers in this sector tend to feel that political factors will prevent any further disappearance of major vehicle customers, just as some, perhaps over-optimistically, put their faith in the view that European governments will be forced to act at some point even in the case of automotive electronics components. They also recognise that, in spite their own increasing exposure to international competition, overseas customer/supplier relationships are still highly "tied", and are understandably concerned about the danger of the UK market opening up more rapidly than overseas markets.

However, relationships between assemblers and suppliers are changing. Given their own heavy funding demands, most vehicle customers are reluctant to take on the heavy investments required in the automotive electronics field. On the other hand, electronic developments dictate even closer design and systems coordination than was the case with electro-mechanical systems, so that customers must anyway retain a substantial expertise and involvement.

Engineers at VW have suggested this might lead to a much closer relationship between assemblers and electronic companies directly, which could tend to squeeze out "systems" companies such as Smiths and Lucas. In fact, the task of systems companies is getting more difficult as vehicle systems are rapidly becoming more sophisticated and complex. Opportunities for systems companies, in my view, will therefore continue to develop, though the presence of new entrants will further intensify competition. On balance these developments will probably loosen ties between systems companies and assemblers.

To date Japanese suppliers such as Nippon Denso and Mitsubishi Electric benefitted considerably from extremely close customer relationships. Their levels of R & D expenditure are fairly high <>, but they receive considerable support from assemblers. <> Similar support also applies to investment in plant and the rate of modernisation of Japanese plants is highly impressive. So far this close relationship has inhibited their ability to attack more global markets.

Suppliers now, however, recognise that to recover substantial investment outlays looming, and to exploit experience effects, there may be some advantage in slightly loosening traditional customer ties. Suppliers such as Nippon Denso already display more independence than typical Japanese automotive component suppliers. Shimokawa (1982b) believes there will be some decoupling in Japanese customer/supplier relationships; though even in this sector where the pressures for change are greater, he is probably correct in indicating only a limited shift. Traditional

business relationships appear very strong in Japan.

To summarise, volume benefits are sufficiently high to encourage slightly looser relationships between suppliers and assemblers. One effect may be much sharper Japanese competition in the future. As mentioned, there are already some signs of this. Nevertheless, close supplier/assembler relationships will continue to be important. Therefore given the importance of volume, any further tendency for UK vehicle assemblers to "open up" to overseas procurement in advance of reciprocal developments overseas would damage this sector.

5.37 Technological and manufacturing developments

Manufacturing processes have undergone a total transformation in the move from electro-mechanical to electronic systems. Such a fluid situation makes international productivity comparisons dangerous, yet the commitment demonstrated by the Japanese in the manufacturing area appears to reflect closely what is happening in other automotive component cases discussed.

Sophisticated modern equipment is much more evident as a competitive weapon in this component area than in the others. The Japanese are making a major push here towards high productivity, highly automated integrated manufacturing systems. New manufacturing systems and equipment are being "turned over" at an extremely rapid rate.

Even in a situation characterised by such rapid strategic change, Japanese manufacturers tend not to see grand stratagems such as internationalisation, moves towards

industry consolidation or diversification as the key strategic issues; again, they point instead towards progress achieved on much more specific targets affecting manufacturing areas - key priorities such as productivity, "zero defects", value analysis, design developments aimed at materials savings, and "worker based" morale programmes. Nippon Denso for example claims 20 to 30 suggestions per employee per year from its quality circles. Production areas still abound with the same highly visible charts noted in other component factories, showing targets and achievements on fairly basic issues. Their commitment to detail is perhaps illustrated by the seriousness attached to the many signs exhorting all employees not to use the lifts so that the company can save energy.

Japanese manufacturers in this sector have resisted manufacturing approaches such as standardisation. Close customer ties have dictated customer responsiveness even given the difficulty of having to learn to handle large numbers of product variations efficiently. This has been incorporated in key manufacturing targets.

This approach is particularly evident in the case of Nippon Denso's more established electrical products such as alternators. Pointing to impressive achievements on changeover times on one such line a Japanese engineer grinned, "Our target production is one". Also product life cycles have been shortened to allow a new and comprehensive series of alternators every two years, through comprehensive and well integrated future product development programmes, as illustrated in Table 45.

Table 45 New alternator product line programmes

Model Type/ outside diameter	Alternator series 1		2		3	
142mm	90	amps	100	amps	120	amps
135mm	75	"	90	"	100	"
128mm	60	"	75	"	90	"
124mm	50	"	60	"	75	"
114mm	40	"	50	"	60	"
107mm	40 amps		50 amps			

Source: Japanese company

Such an integrated product development programme enables individual product offerings to be continuously updated, with each new series coming out every two years, whilst making the maximum usage of investment. <> This approach is continuously eliminating older lines <>.

Japanese manufacturers' approaches were thus not based on crude standardisation programmes, such as elimination of marginal customer accounts for example, but were subtle and aimed at ensuring considerable flexibility both in terms of the number of products handled (this manufacturer was handling 400 different types of starter motor and 200 types of alternator) and also in the extent of product innovation that they could handle.

In general, through continuous and dedicated attention to detail, Japanese manufacturers such as Nippon Denso appear to have not only improved levels of efficiency but, more importantly in their own eyes, they have managed to enhance the overall effectiveness of their service. They felt this enabled them to assist customers to optimise performance over a wide range of models and engine types. The subtler issue of effectiveness, though, is of course more difficult to quantify than that of efficiency, but it

is nevertheless extremely important from the point of view of competitiveness.

Thus although issues arising from volume and internationalisation will I believe be important in this sector, management cannot afford to neglect these more detailed and perhaps subtler matters.

5.38 Conclusion

There are already signs of decline even in this sector, where opportunities are exceptionally attractive; but the real threat lies at a later stage in the life cycle of these new electronic products when competition is likely to increase.

Tacit collusion under which major automotive electrical companies held off serious attack on each other's instrumentation markets, has broken down in the last five years as a result of technological and market opportunities created by electronics. Such opportunities, together with economies of scale and experience effects which are particularly important in this sector, are attracting new entrants and changing the essential structure of competition.

However though transport costs are low, traditionally close, often nationalistic customer relationships and the need for close coordination and market sensitivity may inhibit this process. Yet the immediate competitive arena has already moved to Europe and Japanese (and possibly US) manufacturers are expected to represent more serious competition in about five years time. Pressure is likely to

intensify for rationalisation within Europe, leading to the elimination of some competitors within the next ten years. By this time some rationalisation on a more global scale (including the USA and Japan) will probably have begun.

Just as direct international competition is beginning to increase, there are signs that the international competitiveness of this sector has weakened. Changes in the UK's relative international cost position appear to have damaged the position. The sector is heavily dependent on the UK's weak vehicle industry base, which is particularly important because of volume benefits and the need to keep up technologically. The UK's lack of strength in depth in electronics expertise (and in management in this area) is also a problem. Late government recognition (in comparison with France and Japan) of the need for some strategic initiative may also have already damaged competitive prospects.

Manufacturers need to be sensitive to changes noted in the pattern of competition. Whilst the UK industry's recent strategy of domestic consolidation would certainly be attractive were competition to remain predominantly UK only, a similar danger to that already manifest in automotive bearings is evident. Given rapid internationalisation, such a strategy is likely to encounter, head-on, powerful overseas competition. Unless this strategy is followed up by major international linkages, the UK position would seem to be weakly supported in Europe. Whilst a stronger base in continental Europe represents the immediate priority, within the next ten years there will be a need for linkages to improve the industry's position with at least one of the

other major world markets, Japan or the USA.

Despite internationalisation, manufacturers must be wary of any loosening in their relationship with UK vehicle customers. Overseas vehicle companies are still closely involved with, and supportive of, their local suppliers and they are likely to "open up" more slowly than UK vehicle companies. This means UK suppliers must remain highly orientated to the needs of UK vehicle customers, and to do so they must strive to remain as flexible as possible.

More basic issues cannot be ignored. The pace of technological change in this sector will increase the importance of research and development. Although the UK record here is relatively good, the ability of UK manufacturers to match levels of funding support evident in competitor countries such as Japan is more in question, particularly in terms of investment that will ultimately be needed to translate developments into new processes. The ability to develop and market new product lines is also likely to be important. At this stage in the "product life cycle" more incremental production improvements are less significant for this sector than for other automotive components discussed. However they are important for more mature automotive electrical products and are likely to be so for this sector in the future. The need to keep up with such a rapid pace of change will require manufacturers to foster employees' wholehearted participation and commitment.

Decline in this attractive, "star" component sector has so far been less severe than in others, but future threats demand immediate attention. High investment levels likely,

the support received by overseas competitors and the need for strategic initiatives suggests further coordination between suppliers, UK vehicle customers and government is necessary. Unless there is a more general recognition of the need for more adequate profit levels their leeway for action will remain limited, and the UK will miss out on investment opportunities important to this sector's future.

5.4 Automotive exhaust systems

5.41 The UK market

Exhaust systems, comprising silencers and associated piping, are frequently replaced, so that the aftermarket is relatively much more important than for other products discussed. The aftermarket (AM) has traditionally been considered more profitable than the original equipment (OE) market. Eurofinance (1980) cited Smiths' AM profit margins as having averaged 11.3% between 1974 and 1978, compared with only 6.1% for OE. Exhaust systems are regarded as a particularly "lucrative market" (Saso, 1981).

AM sales depend on the size of the "car parc". Whilst foreign vehicles have penetrated UK markets quite rapidly (depleting domestic OE component markets), foreign penetration of the domestic "car parc" has occurred more slowly. This has cushioned AM manufacturers against declining UK vehicle production levels. There has also been the opportunity to attack the AM for foreign-made vehicles, especially after the government's legislation against franchising.

A survey by Marplan suggested that the DIY market has been growing particularly rapidly. This comprises about 25-30% of the UK market, and a slightly higher percentage on the Continent. Some component manufacturers, such as GKN, have also used the AM as a means of vertically integrating operations into distribution, an attractive opportunity for growth in a declining market.

High transport costs in relation to value added, and the relatively low level of technology involved have

insulated UK manufacturers from international trade. Direct trade in exhaust systems is still low, partly because of their bulk in relation to value and official trade figures are not even produced. Official figures for UK manufacturers' sales, shown in Table 46, ought therefore to reflect UK market trends.

Table 46 Sales of exhaust systems and parts

	1973	1975	1977	1979	1981	1983
Mfrs' sales, £m	26.6	39.1	58.8	74.5	38.1	42.2
Coverage, %	98	98	94	94	77	77
Adjusted sales, £m	27.2	39.9	62.6	79.2	49.5	54.8
WPI, 1980=100	33.3	50.7	71.2	86.0	110.6	126.5
Sales, £m 1980	81.5	78.7	87.9	92.1	44.7	43.3

Source: Business Monitors PQ 381.1 and PQ 3530

My interviews suggest, however, that these official figures reflect AM trends rather poorly, and that the real decline here may be only 20-25%, though OE sales may have fallen further than this. Yet even in this component market, enhanced by the existence of an attractive aftermarket, decline since 1979 has been very severe.

5.42 Company performances

To gain some indication of company performance levels in this sector I analysed the performances of a sample of five companies for which continuous figures were available: together their sales in 1975 amounted to 42% of the market suggested by official figures. Financial reports of other major participants such as Armstrong, Automotive Products and Quinton Hazell were not included since exhaust systems manufacture represents a low proportion of their activities.

Results are shown in Table 47, Tenneco Walker figures being segregated because losses equivalent to -191% and -95% in 1975 and 1976 would otherwise be unduly distorting.

Table 47 Exhaust systems company ROCE and growth performances*

	ROCE 75-79 %	ROCE 80-81 %	ROCE 75-81 %	Growth 75-79 % p.a.	Growth 79-81 % p.a.	Growth 75-81 % p.a.
TI Cheswick	47.7	8.1	36.4	11.4	(22.1)	(3.1)
TI Nicholson	55.8	29.0	48.2	4.3	(2.3)	2.0
Burgess	16.2	7.4	13.7	8.9	(19.2)	(2.7)
Chilcotts	21.8	15.0	13.9	8.1	(21.6)	(4.1)
Average	35.4	14.9	28.0	8.2	(16.3)	(2.0)
Tenneco W.	(42.1)	2.3	(29.4)	14.8	(6.5)	6.4

* Growth is sales growth after inflation (WPI)

Source: ICC Automotive Component Business Ratio Report

Table 47 reinforces the sales picture just discussed. The sharp reversal of trends after 1979 suggests a fall in volume of 29% (taking all five companies) over the two years to 1981.

Average return on capital employed (taking the first four companies), 35% between 1975 and 1979, fell back to 15% between 1980 and 1981. After early losses, Tenneco Walker had recovered to reasonable levels of profitability by 1978, but then it too fell sharply. (AM orientated companies such as TI Nicholson have indeed done noticeably better than OE orientated companies such as TI Cheswick and Tenneco Walker).

Profit and sales performances have thus been better than in other component sectors, yet here too there has been a sharp reversal following 1979. Accounts of exhaust system companies visited in Japan and the USA do not indicate such substantial decline in either sales or financial

performance.

5.43 The changing pattern of competition

5.431 The general situation

Major companies felt competition in OE and AM markets could not be differentiated. TI Silencers and Tenneco Walker both appear to accept lower profitability on OE operations, because in the long run a strong OE position is critical to remaining competitive in their more profitable AM operations. The distinction is of more significance to smaller manufacturers, but should generally be treated cautiously.

In the OE market the main competitors are TI (particularly Bainbridge and Cheswick), Tenneco Walker and Gillet. Armstrong, previously quite heavily involved, has more recently been largely squeezed out. Other major companies involved maintain more limited manufacturing facilities, rely much more on factoring, and generally focus more on AM and distribution operations. Chilcotts, a rather smaller company focuses on OE commercial vehicle business.

Given such a variety of products still in use in the AM, even the largest manufacturers are prepared to factor marginal orders, and some smaller companies find further scope for their activities by concentrating on particularly lucrative product types or on lower order runs. Grundy and Eminox specialise on stainless steel applications and opportunities are provided by the need for more customerised products or services. Table 48 gives details of major AM competitors.

Table 48 Shares in the aftermarket and comments

Tenneco (Harmo)	<>	German No 1, No 2 in French AM
TI (eg Nicholson)	<>	UK. Mfr ops in Holland and Spain
Burgess	<>	UK
Quinton Hazell	<>	UK. No 3 in French AM
Armstrong	<>	UK
SU-Butec	<>	BL Unipart's subsidiary
Automotive Products	<>	UK
Bosal	<>	Belgium MNC. No 1 in French AM
Peco Silencers	<>	UK

Source: Company interviews

Although international trade is small, the impact of other European companies using local manufacturing operations is considerable. The AM is a lucrative opportunity and overseas manufacturers are involved in the UK AM for vehicles imported from their own countries; the relatively poor opportunities for scale benefits further discourage exports but facilitate a network of local manufacturing operations. The OE in its own right is probably a less attractive market opportunity, but the opportunities provided by technology and by scale advantages are probably greater; though here the driving force for change has been requests from multinational vehicle companies such as Ford.

Germany's Tenneco is represented in the domestic OE market by its UK subsidiary company Tenneco Walker, and in the AM by another subsidiary Harmo. The group is probably the most powerful in Europe, being further supported by manufacturing operations in Germany (Mannheim for OE, Langor and Ernst for the AM), in France (Ballinger), Denmark (Stalla), and an operation in Holland. With an aggressive pricing reputation, their impact on the UK AM has been

immense. In recent years, they have increased their share in the AM at TI Silencers' expense <>.

Likewise a Belgium company Bosal, supported by a number of European plants and now a manufacturing presence in the UK, has entered the market. The market leader in the French AM, they too have integrated operations within Europe. They even have their own shipping operation, which reduces the cost of bringing exhaust systems into the UK. They have taken only a few years to build up to an AM share of about 5%, and their target is reputed to be 10%.

Low price imports have been noted from Ansa in Italy, and from Spanish manufacturers who enjoy a tariff advantage, facing only a 4% tariff in the UK whereas UK manufacturers face a tariff of about 37% in Spain. Volume has so far been low, but the impact on margins has been more substantial.

Thus despite factors unconducive to trade, opportunities presented by AM and OE markets have led to a predominantly European radius of competition between companies, though many compete on the basis of local plants. The impact of this change has increased recently, as overcapacity has contributed to pressures for some rationalisation within Europe. The strategic implications are already evident in the crucial OE market, as will now be discussed in more detail.

5.432 The competitive situation in the OE market

Transport costs have not in fact been a major problem within Europe: they can be reduced by expeditious shipping arrangements <>. In respect to their OE business, companies such as SU-Butec, BL Unipart's subsidiary, have found

considerable scope for raising the level of technology and so justifying exports to the continent.

Costs to the UK or Japan would be higher, but these markets have also been distinguished by different pollution and noise controls. These factors may be changing and BL's increasing involvement with Honda might raise the question of tooling economies through joint production arrangements at some point. Japan, however, is committed to just-in-time arrangements which involve local exhaust system production and the USA is following suit, so there is unlikely to be significant trade with either of these markets in the immediate future.

Within Europe increasing interest in just-in-time operations has led Ford, GM and also VW to require local manufacturing support from suppliers. Faced with increasing international competition, these vehicle companies have also been under pressure to rationalise their European supplier networks so as to reduce costs. Ford's wish to reduce tooling costs <> was suggested as one of the key reasons for its decision to reduce the number of its European exhaust systems suppliers. These start up tooling costs are increased by homologation in Europe (which will probably hit smaller UK suppliers particularly hard). The effect of Ford's decision is to squeeze out manufacturers only marginally competitive in European terms. Significantly, its three major surviving exhaust system suppliers are all supported by international manufacturing operations, and can support both Ford UK and Ford Germany.

Like Tenneco, the leading UK manufacturer TI Silencers has established operations on the continent - a

manufacturing and warehousing operation in Holland close to the German border, established in 1969, and a manufacturing operation in Spain, established in 1981.

Even this may not prove enough. <>

To take full advantage of international operations, companies such as TI Silencers are now having to review organisational structures with a view to obtaining greater integration (just as happened in bearings). Scale economies are considered to be low and plants have to handle an enormous variety of products. In the past industrial relations (and security of supply) was also a key problem, so the policy was to have a number of fairly small plants, allowing management as much automomy as possible. <> This is changing and to compete the group is having to consider tightening its structure, not only nationally but internationally. <>

Gillet, a German company, has been in a strong position, having responded earlier to Ford Europe's request to establish a modern factory close to their engine plant at Bridgend in Wales. Ironically Gillet received considerable financial support for this from the British government. In doing so they cemented their strong relationship with Ford. It is feared that Gillet's investment in the UK also reflects longer term objectives in the AM. Gillet has also extended its manufacturing operations, into France in 1975, and into Spain in 1977 to support Ford's Fiesta.

Armstrong's problems in the OE market illustrate the strategic implications for UK manufacturers of rationalisation taking place within Europe. The weakest of

participants, with full product ranges and full vehicle customer support facilities such as test rigs, Armstrong has been largely squeezed out at very considerable cost.

Armstrong saw their main problem as costs rather than non-price aspects such as quality, <>. Their position was weakened by rising relative UK labour costs after 1980 (labour costs are roughly 25% of sales value, but the cost of other major items such as steel is fairly similar for European competitors). Overseas competitors benefitted from less severe financial conditions elsewhere and from the ability to spread fixed costs, R&D etc over a wider market base. The Tenneco Group, for example, was financially strong enough to sustain low UK prices over a long period, and so was able to squeeze out weaker UK competitors.

However, because of changes in the pattern of competition, Armstrong also suffered from a more strategic problem. Although the parent company is one of the top automotive component performers and financially relatively strong, it has other more attractive and closely related market opportunities. Its Cheadle and Blackburn exhaust systems plants had only been acquired in 1975 as part of Huntsville and its commitment to this sector has not matched that of competitors. The company was seduced by an extremely attractive deal from GKN into surrendering the core of a strong AM distribution network it had carefully built up, and without this support its AM position in exhaust systems must have been weakened.

Its major mistake was in committing major new investments into volume orientated plant directed at the OE market. As in the case of RHP, this led to a head-on

competitive collision with more powerful internationally based companies. Its demise was far more dramatic, since in Armstrong's context the importance of preserving flexibility was even greater. For exhaust systems volume benefits are lower than for bearings, and customer order sizes have fallen even more sharply.

In June 1978, <> was invested in a modern, volume orientated new plant at Hull. Geared specifically to the OE market, operations were integrated from the point where pipe entered at one end to where completed exhaust systems emerged from the other. This involved automated assembly lines, automatic transfer equipment and key items of equipment, which were also volume orientated.

With changeover times on such lines of the order of two days, they became highly inefficient as order runs, with only a few exceptions, fell below about 2,000. At a factory level, fixed costs were anyway higher, so that falling overall volumes rapidly fell below break-even. In January 1981 this modern plant was closed and work transferred to Armstrong's original exhaust system base at York. Much modern equipment was salvaged but remained volume orientated. As business conditions continued to deteriorate further competitive retreat was inevitable as the company retrenched onto Cheadle and Blackburn.

Table 49 evidences a continuing reduction in batch sizes, made even more difficult by an increased number of product programmes.

Table 49 Trends in production batch quantities

Year/Quarter	Batch quantity (average figure)
<>	

Source: production records

During 1981 and 1982 batch quantities halved. Faced with setting up times now almost equal to operating times on some equipment, the company made desperate attempts to improve flexibility. Set up times on some machines were improved. <> They have succeeded in reducing factory through time <> to improve responsiveness to order variations and to reduce investments in stocks and work-in-progress. Such efforts helped regain some of the flexibility of more traditional, modular processes.

Despite such efforts and heavy investments, total output halved between 1975 and 1981/82 <>. Employment has halved <>. This implies productivity was unchanged between 1975 and 1979, but had improved by about 7.5% by 1981/82 as the company strove vigorously to cut costs. Staff departments have been reduced particularly <>. At the time of visiting the two remaining plants were down to three and four day operating weeks respectively, despite the transfer of business from Hull and York. Such low utilisation frustrated further efficiency improvements.

Armstrong's position was further "wedged in" by intensifying competition from medium sized companies also desperate for business, particularly for anything resembling volume. One such company, with a reputation for "maverick" pricing policies, in fact declined to participate in this study, as with jobs at stake competitive issues had become so highly sensitive. Automotive Products and Quinton

Hazell, though mainly AM, were vulnerable also and were having to compete fiercely. Smaller UK manufacturers, such as Peco Silencers and Burgess, better adapted to poor order sizes, were also fighting to survive. Burgess for example was reputed to have called in consultants to help with its difficulties.

Like many manufacturers, Armstrong also found its position damaged by BL's determination to get a better deal from the UK components sector, in order to sustain its own competitive position. Through Unipart, BL extended its operations into areas such as exhaust systems, which were seen as particularly lucrative, this being handled through its in-house manufacturer SU-Butec. <> In the OE market SU-Butec could take advantage of BL's own "cream" volume business, sufficient to justify modern integrated volume line production methods.

BL used its copyright position on exhaust systems to sue Armstrong successfully for infringement, (Engineer, 8-15 April 1982, p11). Other exhaust manufacturers were reported as having been forced to pay 7% royalties, a substantial figure given the pressure already on margins.

Such moves by BL really reflect the change in the bargaining position between vehicle manufacturers and UK suppliers already discussed. BL has achieved similar gains at the expense of suppliers by increasing international procurement generally, and until UK suppliers can offer a more internationally competitive deal to their customers this type of problem is bound to continue.

Yet, despite internationalisation, close OEM / supplier

links are still an important feature distorting "free competition". Exhaust system companies argue that much of the continental market is "tied". GM produces most of its own in-house and the German market is fairly nationalistic: Ford Germany buys mostly from Tenneco and Gillet. VW's supply situation is complex, but it appears to buy mainly from Gillet. Even in the AM, UK suppliers felt that only about 10 to 15% of this market was "up for grabs". The danger, if BL "opens up" ahead of overseas vehicle manufacturers or applies other negotiating levers too severely, is that many UK suppliers, faced with an asymmetrical competitive situation in Europe, will collapse. The UK may be "divided and ruled" by overseas competition.

Some suppliers alert to the situation in factoring point to the demise of UK manufacturing operations in other products - Wilmot Breeden for example has largely stopped manufacturing locks and even their vehicle fittings business is reputed to be "shaky" - Japanese suppliers coming over in the wake of Honda were rumoured to be offering British component companies attractive margins based on manufacture in Japan. Faced with such difficult UK conditions, some suppliers might be tempted, even though recognising that such expediency would signal the end of future competitiveness. Any weakening in the UK supplier base will ultimately rebound on UK vehicle customers.

Armstrong's demise highlights the need for UK manufacturers to be sensitive to changing competitive conditions, and the danger of ignoring the increasing impact of European competitors particularly in volume markets. Although its good financial performance must be qualified by

the fact that it appears to have surrendered market share, especially in the AM, TI Silencers' performance has been relatively good (see Table 48). It has a clear picture of the competitive battle taking place in Europe. <>

Thus TI Silencers' better performance seems partly to reflect its alertness to the need for a stronger base in continental Europe, accompanied by some degree of reorganisation so as to extract the maximum possible synergy from its international operations.

5.44 Basic manufacturing issues

5.441 Productivity comparisons

British exhaust system manufacturers visited were compared with two overseas plants: <JS1's> plant in Japan employing 480 people and <USS1's> plant in the USA employing 375 people. Both were about 90% OE and so perhaps most comparable with TI Cheswick whose plant sizes were similar. The American plant in particular was able to benefit from longer production runs. Some indication of UK productivity is given in Table 50.

Table 50 UK exhaust companies sales/employee £'000,'82

Company	OE/AM	Recent estimate £'000	Year	Past yr est £'000	Year
TI Cheswick	OE	57	1982	30	1979
Tenneco Walker	OE	19	1979	15	1975
Chilcotts	OE	26	1981	36	1973
SU-Butec	OE/AM	31	1980	na	
<UKS1>	AM	<36>	1982	<44>	1979
Harmo	AM			37	1976
Burgess	AM			21	1975
Quinton Hazell	AM	23	1976	21	1972

Source: company accounts. Figures for <UKS1's> exhaust systems activities supplied by company. All figures adjusted to 1982 prices.

Exhaust systems prices have recently fallen behind the wholesale price index, so that UK progress on productivity is probably understated. The actual number of units/man/month produced at <UKS1> remained unchanged at about 67 between 1975 and 1979, and actually rose about 7.5% by 1982. Productivity in other companies has been mixed but generally fairly stagnant, partly as a result of low utilisation levels; but TI Silencers' performance is relatively good. TI have trimmed indirect staff particularly, so that its ratio of direct/ indirect staff has risen <>.

In comparison, sales/employee at the Japanese plant <JS1> was approximately £72,000 in 1982 based on that year's exchange rate of 435.2 yen/£. By 1984 sterling had fallen to 300 yen/£ so this exchange rate is probably unfavourable to the Japanese, whose domestic car prices in 1982 were well below those prevailing in Britain. This suggests an appreciable gap between the UK and Japan.

Without a value based productivity estimate, the US plant <USS1's> estimated figure of 18.7 silencer boxes/man/day plus piping, at roughly twice the Japanese

figure of 9.4 seems almost dubiously high. Differences in products and mixes in respect to piping may be distorting. Surprisingly, the US estimate of the proportion of sales value going on bought-in goods and services was higher at 30 to 35% than the Japanese estimate of 18 to 20%. Both US and Japanese plants received R&D assistance not included in their figures. However US production runs were very much higher than in both Britain and Japan.

Sales for the Japanese plant's parent company had grown 88% after inflation between 1971 and 1980, compared with a rise in employment of 13%. Historical figures were not available for the plant itself, but the productivity target was claimed to be 20% p.a. expressed in exhaust system units/man. This had fallen to about 16% p.a. between 1980 and 1982 partly because of the downturn, and this was said to have led to management being "scolded"! Historical figures were not available for the US plant itself, but figures for the parent group (1,700 employees) perhaps give some indication. Sales/employee after inflation in 1981 fell 5% below the 1980 figure, but had recovered to 9% above by 1982, following a turnaround in their exhaust systems AM in April 1982. Both Japanese and American plants benefitted from more favourable market circumstances, but productivity performances seem well ahead of the UK.

5.442 Production issues

American and Japanese plants were respectively 22 and 13 years old, with considerable evidence of plant modernisation. However not all plant was so different: modern British plants had recently installed the same Eaton

Leonard CNC pipe bending machines as US and Japanese plants.

The most striking difference lay in the flexibility of the Japanese plant, this being the result of "just-in-time" developments. The plant had been built at Toyota's request, in close proximity. Since then they have gone from deliveries only about once a day though only on one type of exhaust system, to about eight deliveries a day involving many types.

Under guidance from specialist engineers at Toyota, they have systematically had to develop more flexible manufacturing methods. One auto-arm press, for example, now has to be changed over between 10 and 15 times a day, so they had to find ways to reduce changeover time to about 10 minutes. A machine tool company belonging to the same group has assisted with better adapted machines: 20 recently installed Aida auto-sheet feeders have quick tool change characteristics. New more flexible technology has been introduced, such as CNC multiform pipe benders which are well adapted to the problem of intermittent order take-offs and CAD/CAM, so as to facilitate quicker design and manufacture of new jigs and fixtures; but these developments are being pursued now in all three countries.

The sheer volume of incremental production changes is however remarkable. A press bending machine, converted to reduce changeover time (about 30 minutes seven years ago) to about 10 minutes, is one example; but numerous machines have had to be changed since the flexibility of the production flow rate often depends on the least flexible machine. Inherently inflexible machines have necessitated

changes in factory layouts and flow routes. Pre-set tool packs are used. Though one or two "dedicated" volume assembly lines have been segregated, most have been adapted to handling as many as ten major types of exhaust system.

Responsiveness to changing customer delivery requirements involved reducing factory through times and getting their own suppliers to respond in the same way. Just as Toyota developed a card system to inform them the moment more items were required, so they developed a similar system with their suppliers. Having reduced their own factory through time to 15 days some time ago, further progress was frustrated because material suppliers took a month to respond to the new orders. Both cooperated on the problem and they now claim each can respond in 5 days, making a total of 10.

UK and US manufacturers have had little experience of just-in-time arrangements, but TI's Cheswick plant has been substantially changed, reducing factory through time <>. Savings, on items such as stocks and work-in-progress costs, have also been substantial.

Japanese progress reflects sustained, patient attention to detail by numerous quality circles. These originated under the influence of Deming statistical quality control techniques, whose simplicity enabled production work groups to take responsibility for their own quality. Recognising the wider implications of such active participation, management focused attention and training resources onto these work groups. The groups were so successful on quality improvements that their role was extended to productivity improvements and other production matters such as flexible

manufacturing methods. Morale and participation are high. This plant receives an average of 9.6 suggestions/employee/ year.

The plant's trump card is that with rapid growth they have been able to sustain "lifetime employment". Employment slightly increased between 1971 and 1981 but otherwise remained extremely stable. Employees, confident that improvements such as productivity would not merely lead to themselves or their colleagues being laid off, were prepared to give 100% commitment and total flexibility. The company in return redoubled efforts to maintain competitiveness in the marketplace and was even prepared to bring in subsidiary business when necessary: steering wheel manufacture introduced to maintain stable employment represents roughly 7% of turnover. There seems to be a genuine, long term two way partnership.

The Americans, protected by a less exposed home market and better production runs, are nevertheless responding to such developments with greater dynamism than UK manufacturers.

Assisted by a six-fold revival in earnings in 1982 as compared with 1980, <US1s'> parent company's 1982 Business Report announced the key points in a new strategy, backed by a major investment programme, to rebuild their competitive position as "the industry's lowest cost producer":

> "Eight new computer programmed and controlled pipe-bending machines, capable of producing a major proportion of our total bent pipe needs. Advantages: Rapid changeover to new part numbers; scheduling flexibility for inventory balance; consistent high quality.
>
> A program to convert muffler lines to quick changeover

capability, to facilitate greater scheduling flexibility, improved inventories, rapid turnover.

A new high-speed shear press with quick changeover die inserts that blanks, notches, ribs and embosses muffler shells and wrappers in one operation. Changeover time has been cut by half."

Capital investment can only be a part of the answer to increased flexibility. Changeover time in their press shop's box making machine was still about 2 to 3 hours and was similar on other machines. Despite the annual report's natural optimism, the implementation of real flexibility will present an enormous challenge. In production areas it was admitted that set up times were still very long, and the pervading corporate culture still seemed volume orientated. To quote: "Our philosophy is volume" and "For us 15,000 runs are great!". One of the key questions is whether such American companies can really win over the total commitment of an enthustiastic but insecure workforce.

Yet the report also emphasised other "Just in Time Preparations" and recognises the amount of "fine tuning of production processes" necessary in addition to capital projects. It also emphasised how facilities were now being "converted to the Deming statistical quality control system". Their in-house magazine "Pipeline" (Winter 1982) went on to remind employees that

> "This system was developed by Dr W.E.Deming of New York University during the 1950's but generated only limited interest in the United States. The Japanese, however, seized on it, and it is now in almost universal use in Japanese industry."

The report indicated a coordinated initiative by US vehicle customers along the same lines as happened in Japan just over a decade ago.

"In addition, many of our manufacturing engineering,

> OEM sales and production scheduling personnel, including members of the labor union, have attended "just in time" seminars at Ford World Headquarters in Dearborn for thorough backgrounding on the system."

The new strategy also points to:

> "intensified product development and service activities by OEM sales and engineering teams working in close collaboration with automakers."

There is one final element in this American turnaround strategy which UK manufacturers should also consider. Recognising that resources necessary for investment and other "plow-back" activities require some sacrifice in short term living standards, this US company

> "negotiated important changes in the labor contracts at the organised facilities that helped the company meet price competition in the OEM market."

Thus UK manufacturers must take more positive steps to match Japanese and US rivals on such developments taking place in production areas, and some change in organisational focus may be called for. TI Silencers' relatively good profit performance is, I believe, partly attributable to recognition at Board level of the strategic importance of such matters.

5.44 Conclusion

High transport costs, relatively low opportunities for scale advantages and a customer preference for local manufacture (particularly given increased interest in just-in-time systems) mean that most exhaust systems for UK customers will continue to be made in Britain. Nevertheless opportunities presented by AM and volume OE markets have led increasingly to a European radius of direct competition from the viewpoint of UK companies. Pressure for rationalisation

in Europe increased markedly after 1979. The effect was first felt in volume OE market segments, but the aftermarket is also coming under increasing pressure and smaller companies will also be affected in the longer term. Such pressures will intensify further in Europe, but the effect of competition from further afield will remain merely indirect for many years.

The sharp performance decline, even in a sector made more lucrative by the existence of an attractive AM, reflects declining UK competitiveness. This has been exacerbated by sharp decline in the UK cost position, and by a business climate so discouraging that some of the most modern assembly lines have had to be literally broken up. It is also worrying to see government support for overseas companies establishing UK plants, in situations where UK manufacturers are likely to be squeezed out.

Yet some UK manufacturers have worsened their problems through being insensitive to the strategic implications of European competition, especially in the volume OE market. Armstrong has suffered particularly in this respect. TI Silencers' relatively good performance reflects in part a recognition of the need, in this situation, to harness the advantages of a strong manufacturing base in continental Europe. It also reflects Board level recognition of the need to match international standards on key issues such as productivity and flexible manufacturing methods. Had UK manufacturers generally demonstrated the commitment displayed by Japanese and US rivals to ensuring an internationally competitive supplier service, their performance decline and the threat hanging over them would

both have been less severe.

Though there is some scope for new technology to increase the flexibility of manufacturing operations, the Japanese experience indicates that more incremental improvements to production processes will play a critical role, both in respect to FMS and other important issues such as productivity and quality. Thus more positive participation and involvement of those in the production area will prove particularly important in this sector (as also in automotive forgings). This may call for a fresh approach to industrial relations and a more production-centred organisational approach.

Restoring this potentially lucrative sector's future would probably demand a coordinated approach: it requires economic choices by Britain more favourable to business development, the active involvement of UK vehicle companies (particularly in respect to just-in-time developments), greater managerial sensitivity to key issues and total support from employees in securing a competitive industry.

6 Automotive Component Sector Generally

6.1 The impact of internationalisation and of the UK's declining trade position

Table 51 shows total production and trade figures (adjusted to 1980 prices) for motor vehicle parts and accessories from 1938 to 1982. Business Monitor production figures have been adjusted to exclude tyres, inner tubes and identifiable agricultural parts, to bring them more closely into line with trade figures taken from SMMT.

Table 51 Production and trade performance of UK motor vehicle parts manufacturers

51A.

	Exports	Imports	Trade Surplus	UK Prodn	UK Market	WPI
	£m'80(1)	£m'80	£m'80	£m'80	£m'80	1980=100
1938	50	30	20	770	750	6.16(2)
1948	170	15	35	1270	1115	12.32
1953	330	35	295	1840(3)	1545	17.39(3)
1958	580	45	535	2470	1935	19.30
1963	740	60	680	3250	2570	20.81
1968	980	230	750	3620	2870	24.32
1973	1510	470	1040	3980	2940	33.32
1974	1530	520	1010	3550	2540	41.47
1975	1610	530	1080	3380	2300	50.69
1976	1780	740	1040	3650	2610	59.45
1977	1610	740	870	3600	2730	71.22
1978	1590	790	800	3730	2930	77.66
1979	1610	950	660	3710	3050	85.96
1980	1440	690	750	3190	2440	100.00
1981(4)	na	780	na	na	na	110.60
1982	1160	890	270	2530	2260	120.10

(1) converted to 1980 prices using WPI
(2) 1937
(3) 1954
(4) import figures not available due to Customs & Excise strike

51B.

	Exports/ Production %	Imports/ UK Market %	Trade Surplus/ Market %	Imports/ Exports %
1938	6.5	4	3	58
1948	13	1	14	9
1953	18	2	19	10
1958	24	2	28	8
1963	23	2	26	8
1968	27	8	26	24
1973	38	16	35	31
1974	43	20	40	34
1975	48	23	47	33
1976	49	28	40	42
1977	45	28	32	46
1978	43	27	27	50
1979	43	39	22	59
1980	45	28	30	48
1981				
1982	46	39	12	77

Source: Production figures from Business Monitor; trade figures from SMMT yearbooks

Excluding inflation, the volume of imports more than trebled between 1970 and 1982, so that the impact of direct international competition is now substantial; the volume of exports, however, had by 1982 fallen back below the level in 1970.

Correspondingly, the strong surplus on overseas trade during most of the period has been cut dramatically. Although there has been a clear long term trend, with imports steadily rising as a percentage of exports from 22% in 1970 to 77% in 1982, the sharpest decline has been since 1980. Taking out inflation, the favourable balance of trade fell by 60% between 1980 and 1982 as the ratio of imports to exports rose from 48% to 77%. The most recent figures, for the first quarter of 1983, suggest imports have now risen to just over 90% of exports, depleting any remaining trade surplus.

Thus UK parts manufacturers' sales have fallen partly

because of a declining home market (due to the position of UK assemblers) and partly because, in the context of increasing international trade, their own international position has declined.

Appendix D.1 demonstrates that decline has affected component sectors comprehensively and Appendix D.2 indicates the declining international trade position of component sectors for which official figures are available. Just as in case studies discussed, it should however be noted that aggregate trade figures often understate the seriousness of competitive decline. As international competition in wheels increased, for example, first Rubery Owen was squeezed out as BL was forced to go for single sourcing to provide Dunlop, its last major UK supplier, with adequate volume since its European competitors, such as Lemmertz and Kron-Prinz of Germany and Michelin in France and Spain, enjoy much larger markets. The Financial Times (19.8.85, p1) has now reported that Dunlop has applied for state aid on "a £5m investment programme crucial to future competitiveness" on the grounds that although high risk, the investment is "essential if the UK is to maintain the strategic ability to manufacture car wheels". Ford, arguing it would require an investment of £9.5m to meet its future demand for lighter motor wheels, "has opened negotiations with the unions to wind up wheel manufacture at its Dagenham factory by 1987". Dunlop has been assured of Austin Rover purchases for three years, "conditional upon the necessary measures being taken to make the product internationally competitive". Such critical international decline would not easily be deduced

from international trade figures.

Table 52 examines changes in the direction of trade.

Table 52 Direction of UK trade in motor vehicle parts and accessories

52A Destination of UK exports: %

	1938	1954	1963	1972	1980
Europe	45	36	42	53	63
America	6	10	16	24	14
Africa	13	15	11	8	10
Asia	14	20	17	9	9
Oceania	22	18	11	6	5
W. Germany	3	3.6	4	8	14
Belgium	2	3	3	8	11
Sweden	5	8	9	10	8
France	1	3	3	4	7
Italy	0.5	2	6	2	6
Netherlands	4	3	3	4	4
Eire	14	2	2	2	4
USA	1	2	7	14	9
S. Africa	8	4	4	3	3
Australia	11	14	8	5	3
India	7	5	5	1	0.6
Former British Empire	61	52	34	14	8

52B Source of UK imports: %

	1938	1954	1963	1972	1980
Europe	31	42	63	80	85
America	69	53	31	16	8
Rest of World	0.2	5	6	4	7
W. Germany	14	9	22	33	32
France	6	11	12	9	18
Belgium	1	1	2	15	11
Italy	0.6	2	4	5	6
Sweden	5	3	8	5	4
Spain	0	0			4
Netherlands	0.5	6	5	2	3
Switzerland	2	2	2	0.3	0.3
Austria	0.3	0.4	3	2	0.4
Asia	0.09	2	4	3	6
Japan	0.07	0.03	1.6	3	4

Source: SMMT yearbooks, taken from official sources

Britain's traditional "Empire" markets represented 61% of parts exports in 1938 but even by 1963 had fallen to only 34%. This has been due to demands for local content and overseas competition, particularly from Japan. The European market has steadily risen in importance from 36% of all parts exports in 1954 to 53% in 1972 and 63% in 1980. Since entry into the EEC even the American market has fallen back in importance, from 24% in 1972 to 14% in 1980.

In 1938 69% of imports were American. Some were a stop-gap prior to US multinational companies establishing UK manufacturing operations; some were parts in short supply in Europe. By 1972 American imports represented only 16% and by 1980 just 8%. By contrast European imports, which compete "head on" with UK manufacturers, rose from 31% of imports in 1938 to 80% in 1972 and 85% in 1980. Germany and France alone accounted for 50% of all imports. Imports from the rest of the world were only 7% in 1980, but Asian competition has increased, particularly from Japan.

The radius of business competition is now Europe.

6.2 Company performances generally

Appendices D.3 and D.4 analyse the sales growth and profitability (ROCE) of the largest 66 automotive component companies for which Inter Company Comparison figures were available continuously from 1975 to 1982. For about 24 of these companies it was possible to extend figures back to 1970.

Table 53 Averaged (unweighted) company performances

	1970-75	1975-79	1980-82
Growth: % pa	0.8	5.4	(10.9)
ROCE: %	18.0	19.4	(2.3)
Growth and ROCE: %	18.8	24.8	(13.2)

Note: Growth figures derived from sales in 1970, 1975, 1979 and 1982, adjusted for inflation using the wholesale price index. Rates represent total % change over period divided by number of years.

Source: ICC Business Ratio Reports / company accounts

Table 53 (derived from Appendices D.3 and D.4) demonstrates more generally the dramatic decline in company performances noted in the case studies. On average sales volumes declined by one third between 1979 and 1982, reflecting market conditions discussed in 6.1 and the inability of companies to offset decline through exports or diversification into other activities.

The decline in profitability has also been unprecedented. Between 1970 and 1979 ROCE's (unweighted) averaged about 18%, ranging from a nadir of 13% following the first oil crisis in 1975 to a peak of 25% in 1977. Profitability remained stable, despite UK vehicle production halving between 1973 and 1979. Average (unweighted) ROCE then fell precipitously to 0.6% in 1980, -3.2% in 1981, and -4.4% in 1982.

Decline has been comprehensive. Companies (detailed in Appendices D.3 and D.4) were ranked into 6 size classifications, each with 11 companies, on the basis of turnover in 1975. Table 54 shows that in the three years 1980-82 every size category averaged both negative growth and negative ROCE.

Table 54 Performances by size classification 1980-82

Size groups in descending order	Growth 1979-82 % pa	ROCE average 1980-82	Growth + ROCE %
Companies 1-11	(9.1)	(3.1)	(12.2)
" 12-22	(10.2)	(4.6)	(14.8)
" 23-33	(11.6)	(5.5)	(17.1)
" 34-44	(12.4)	(1.1)	(13.5)
" 45-55	(12.3)	(4.8)	(17.1)
" 56-66	(9.8)	(6.6)	(16.4)
" 1-66	(10.9)	(4.3)	(15.2)

Source: ICC Business Ratio Reports / company accounts

After inflation only two companies, both in the smallest size category, increased sales volume between 1979 and 1982. Just under one quarter (and in fact only 2 of the largest 22 companies) managed a positive combined total of sales growth plus ROCE.

Of 66 companies, 22 avoided losses in any of these 3 years, 19 made losses in one year only and 9 in two years only. Of the remaining 16 companies which made losses in all three years, 3 had made losses in 4 consecutive years and another 3 in 5 consecutive years. By comparison, between 1970 and 1979 on average just under 9% of these companies were making losses in any given year, the worst figure occurring at the onset of the recent downturn in 1979 when the figure rose to 19%.

The extent and severity of decline cannot be fully explained either by the natural knock-on effect of declining UK vehicle production, which was relatively stable in this period, or by the normal business cycle, since past downturns had only a slight impact on performance figures. ICC's 1982 Business Ratio report examining the top 100

automotive component companies was forced to conclude:

> "To summarise, the companies in this Report have been hit very badly by a whole list of factors beyond their control. It is far too easy to say that a reduction in capacity earlier or diversification into other markets and products should have taken place sooner, but the truth of the matter is many companies did this and yet still made losses...
>
> "There is no doubt that the performance of the UK motor components sector has been horrific and has mirrored, if not led, the decline in industrial output in this country."

This suggests that Britain, and the government to the extent of its ability, must take more seriously the need to avoid economic choices creating such adverse business conditions, so unconducive even to companies pursuing more progressive strategies. Nor can the failure to do so be excused by glib thinking, showing little understanding of business conditions: one Chief Executive interviewed complained that the Minister concerned, on hearing his problems, had merely commented, "Couldn't you make something else?".

The lesson from a company perspective again echoes case findings, that sweeping panaceas are unlikely to prove effective strategies in such a context. Companies in this industry could not, in fact, rely on diversification or on gains in market share or exports. Those that did found their attempts at protecting sales volume frustrated, and many dangerously postponed volume adjustments. Some popular panaceas, such as market domination or industry consolidation, presuppose scale advantages. This issue receives detailed discussion in 6.5, but in this industry there is little general indication that large companies perform better. Companies must therefore carefully examine

the issue of scale in the context of their particular competitive circumstances. As emphasised in product case studies sensitivity to context, responsiveness to change, and commensurate attention to more basic issues seem the most likely paths to success.

6.3 The UK business environment

Prior to 1960, UK manufacturers remained fairly shielded from the full impact of international competition. Until then, vehicle manufacturers and component companies in particular were protected by a 30% tariff.

Between 1960 and 1978, UK wage rates in manufacturing relative to those of rival countries, had been gradually falling, compensating for slower productivity growth. These trends are illustrated in Appendix D.5, which includes supporting figures and an example of the method of calculation. Britain's "real" (inflation-adjusted) exchange rate had moved so as to broadly maintain UK manufacturers' cost competitiveness, which would have otherwise resulted from allowing complacency in respect to productivity. For this reason the Select Committee Inquiry (1975) found no evidence of UK parts being uncompetitive on price with other European manufacturers.

It should be noted that UK relative labour costs are influenced by inflation-adjusted, not nominal exchange rate movements. From the viewpoint of competition, European rather than US rates (where the situation has recently improved) are particularly important.

Between 1978 and 1980, a gross discontinuity in such

trends resulted in relative UK labour rates suddenly moving much more closely into line with those of European and other rival countries. Relative to UK earnings rates in manufacturing, US rates by 1980 had fallen to 66% of their level in 1978, comparable figures for other rival countries being Japan 64%, Germany 75%, France 84%, Italy 85% and Sweden 75%.

The situation by Autumn 1981 is given in more absolute cost terms in Table 55.

Table 55 Labour costs and productivity in the manufacturing industry of major countries, autumn 1981

	Hourly labour costs in DM	Hourly labour costs* as index	Hourly productivity** as index	Unit labour costs*** as index
Belgium	25.50	102	89	115
Sweden	25.20	101	87	116
W. Germany	25.00	100	100	100
US	24.50	98	102	96
Netherlands	24.10	96	97	99
Italy	19.90	80	68	118
France	18.40	74	83	89
Japan	16.20	65	78	83
UK	14.20	57	50	114
Spain	12.60	50	47	106

* Index of 100 based on Germany. Costs include social charges and fringe benefits
** Output per man-hour worked in terms of same currency
*** Column two divided by column three

Source: Financial Times, 12.1.82, from Dresdner Bank

A contributory factor has been a rise over just a few years in the contribution of North Sea Oil to almost £10bn to the UK's international current account. Tighter monetary policy resulted in higher real interest rates and further attracted capital inflows. In the context of dampened demand conditions, inevitably something else had to give on the UK's current account. Real exchange movements noted were

the mechanism by which international trade flows were brought back towards equilibrium. The manufacturing sector, representing almost 70% of the UK's current account transactions, inevitably bore the brunt of this change, so that the manufacturing sector's trade balance did indeed move by something approaching £10bn. The more internationally exposed and weaker sectors within manufacturing, such as the UK vehicle and vehicle components sectors, were in turn affected disproportionately.

As real exchange rates moved, UK vehicle manufacturers and their suppliers both found themselves fully exposed to international competition just as it was intensifying due to international recession; but they were no longer shielded by such high differentials in relative labour rates. UK manufacturers then found themselves faced with the fruits of past complacency.

Yet Britain's economic choices, in allowing such a sudden and unprecedented change in the relative cost position were also to blame. No country, not even Japan under dynamic conditions most conducive to sustainable productivity growth, has ever achieved productivity growth levels such as would have been necessary to offset such a sudden change in relative costs. To put the issue in perspective, few UK component manufacturers have achieved productivity gains of much over 10% in the last decade. Even allowing for "slack", it was inconceivable for UK manufacturers to achieve productivity gains, over a period of less than two years, of over 30%, net of progress being made in more dynamic competitor countries.

UK vehicle assemblers and component manufacturers were likewise affected. UK vehicle prices, reflecting the cost position, jumped so far ahead even of continental Europe that the EEC considered action to try and reduce differentials to under 18%. Even by late 1984, by which time the real exchange rate surge had subsided somewhat, car prices in the UK market were still ahead. For example, the average price of models reported by the Financial Times (18.12.84, p15), comprising Citroen's GSA Pallas, Fiat's Panda 45, Ford's Escort XR3i, Peugeot's 305 GT, the Renault 5 GTL and the Volkswagen Golf GTI, was £5909 in the Belgium market, £6488 in Germany, £6700 in France, £7165 in Italy and £7706 in the UK. The competitive gap, even against Europe, was therefore still substantial.

Internationally aware procurement departments of vehicle manufacturing companies, whilst traditionally cautious about over-reacting to cost changes brought about by exchange rates, recognised UK component manufacturers' decline in cost competitiveness. BL claimed it could purchase 80% of its components at prices 20% cheaper by going overseas, and a similar picture emerged from interviews with German and Japanese vehicle companies.

Volume adjustments were cautious, but the bargaining position had radically changed so that margins available to UK suppliers were cut dramatically. Itself under pressure, BL claimed it had to pass on competitive pressure onto UK suppliers. Despite success in freezing most component prices over the four year period since 1979, Austin Rover were nevertheless able to claim that they had effectively subsidised UK component prices to the extent of £24m during

the same period (Bessant et al, 1984, pp61-62).

Many UK suppliers had been slow to respond to declining customer orders and could take up some degree of "slack", but this improvement merely restored former productivity levels. Some went further by just cutting out less profitable activities, representing further market retrenchment. Nevertheless, despite being dogged by poor market conditions and underutilisation, some real progress has also been made.

The problem is that this has made manufacturing in Britain even less attractive than in the past. Exposed multinationals noted that whilst the UK had been an attractive location for manufacturing components in 1973, the rise in relative labour rates had reversed the position, leading to UK business being relocated. UK suppliers, uncompetitive in costs, were driven back both in export markets and by increased import penetration.

The main problem is that UK manufacturers have been even further discouraged from pursuing strategies needed to improve their longer term position. The decline in financial performances noted in section 6.2 placed perhaps even the majority of UK component companies into virtually a "turnaround" situation. This dictated an approach to strategy similar to that necessarily employed by receivers and precluded many progressive strategies which would not have met the primary requirement of a sufficiently rapid return to profitability. In consequence they have slipped further behind international rivals.

There has been one major gain: a more overriding

commitment to competitiveness by UK manufacturers. If the importance of such a commitment were to become widely recognised, it could even represent a psychological turning point. Even so, improvements needed will still probably take a decade of patient progress (judging by the Japanese experience).

Efforts are probably doomed to frustration, however, unless a radically more conducive business environment is re-established and sustained. Unfortunately although US and Japanese rivals show clear recognition of the need for wage pressures to abate when international competition intensifies, so as to improve their business situations, there still appears little such recognition in Britain, particularly in the trade union movement. This could prove critical.

A more dynamic market is also needed, but this will prove unsustainable unless both customers and suppliers are allowed better levels of profit, so that they can attract the resources to support growth; if not inflation will frustrate such policy measures.

6.4 Relationship with vehicle companies

The competitive strength of the Japanese components sector originates from the recognition of its strategic importance, by entrepreneurs such as Honda and Toyoda (Toyota), and their determination to develop actively a supplier network to match their own needs. The close fostering relationship engineered between the two sectors, has been at the heart of the many initiatives that have transformed the competitive position of both.

Toyota's initiatives for example, detailed in Shingo (1981), began well over a decade ago though drawing little attention from UK manufacturers until recently. These gradually brought about changes in productivity, quality, delivery systems (just-in-time), and more flexible approaches to manufacturing methods, affecting suppliers and their suppliers too, comprehensively.

A Japanese executive explained that Japanese relationships between suppliers and assemblers in Japan were less contractual than in the West. Their agreements with Toyota were brief, often just a single page, and flexible, saving considerable time. Though frequently broken, this was acceptable because the customer relationship was perceived as essentially long term, both "sides" being highly conscious of the fact that their futures depended on each fostering the competitiveness of the other.

Superficially integration between the two sectors might appear lower, since Japanese assemblers typically buy in an even greater proportion of components (about 70% by value) than do UK assemblers. In fact the two sectors are closely integrated on a number of counts:

* Cross shareholdings
* As part of the same business groupings, linked by common banks
* Manufacturing and logistical links
* Financial support, eg on R&D
* Personal linkages as a result of senior executives moving between the sectors, particular as OEM executives retire

Shimokawa, a leading expert on the Japanese components industry, cites the "business groupism" (Shimokawa, 1982a,b,c) between parts manufacturers and assemblers as one of the major factors underlying Japan's international competitiveness, since it permits "vertical integration gains" whilst mitigating the conflict of interests characteristic of Western relationships. He also emphasises that this "business groupism" extends also to machine tool companies and distribution outlets.

In the UK, both vehicle companies and suppliers have taken maximum advantage from opportunities presented by changing business circumstances to raise their own profitability at the expense of the other. Component manufacturers succeeded for a considerable time in achieving a rate of return on capital employed of about 18%, over twice the average for UK car assemblers. It was inevitable that as their customers' fortunes declined, the negotiating positions would change. Manufacturers such as BL had of course to restore reasonable levels of profit to meet their own short term financial targets. They had little difficulty in the context of depressed conditions after 1979 in totally reversing this situation. <> By 1982 average ROCE for the top 100 automotive component companies was down to about 0%, whilst vehicle companies were recovering. Such a see-saw effect is extremely damaging to the competitive situation of both sectors in the longer term, since reasonable levels of profitability are crucial to the provision of sufficient levels of ploughback.

Even BL's partner Honda seemed extremely cautious about BL's rapid moves to international procurement. Surely, they

argued, BL should instead foster its own component base, just as Honda has done as part of its longer term competitive strategy. By coming overseas to Japanese component suppliers, BL risked becoming dependent on suppliers whose bargaining power would increase later.

Internationalisation is though changing the situation. As Shimokawa (1982b) also noted, it could mean that in the future the close relationship which has proved such a competitive strength to Japanese manufacturers to date could become less so, perhaps affording an advantage to more competitive British component manufacturers in sectors where internationalisation is proceeding faster. Some UK suppliers have already taken advantage of their relative independence to pursue opportunities afforded by internationalisation: notably Pilkington's glass, GKN in constant velocity joints, and AE not far behind in pistons.

Such global strategies have so far depended heavily on exceptionally strong patent positions, as Japanese suppliers point out. For most UK suppliers the real fear is that internationalisation is progressing asymmetrically, with UK customers opening their doors to overseas suppliers (partly for reasons of expediency) more rapidly than other vehicle companies, such as GM in Germany, and particularly Fiat whose domestic supplier links are still extremely close. This is a justifiable fear. Williams et al (1983) traced the rapid decline of British shipbuilding, to a fairly sudden "de-coupling" in their relationship with UK shipping line customers some years earlier.

Timing is also important. The international

competitiveness of the Japanese components industry was made possible, because it was protected until the moment the industry was strong enough to survive free trade. Had the Japanese agreed to free trade much earlier, both vehicle manufacturers and their suppliers would probably have been savaged by Western competition. Free trade has never been fully reciprocal, and by now UK manufacturers would in general be far too weak to take advantage of the Japanese market even if it was now, belatedly, fully opened up. Britain cannot ignore internationalisation, but it might be wise to use the EEC to ensure it proceeds on a fairer, more even-handed basis.

The real danger, meanwhile, is that any further de-coupling in the relationship between UK component suppliers and vehicle manufacturers so far in advance of developments elsewhere may result in a process of divide-and-rule working to the disadvantage of both sectors.

This point may be contentious. There are disturbing indications that BL feels it could go it alone through increasing reliance on overseas parts; but I would argue that the competitive success of Japanese vehicle manufacturers has been crucially dependent on extremely close domestic supplier links. Conversely BL's Unipart OE operations depend on becoming independent of BL through an export policy. However, particularly while the UK's international cost position remains poor and while the competitive situation internationally remains asymmetrical, case studies discussed in section 5 and my analysis of more successful companies discussed in section 6.6 suggest there is a limit to the reliance that can be placed on exporting

for the majority of companies.

6.5 The relationship between size and performance

Table 56 Performances by size classification 1970-82

Size groups (descending order)	Growth 1970-75 % pa	ROCE 1970-74 %	Growth ± ROCE %	Growth 1975-82 % pa	ROCE 1975-82 %	Growth ± ROCE %
1-11	3.4	12.7	16.1	(2.9)	8.3	5.4
12-22	0.1	26.5	26.6	(2.9)	11.7	8.8
23-33	2.6	19.6	22.2	(3.7)	19.8	16.1
34-44	(0.7)	21.4	20.7	(1.2)	8.0	6.8
45-55	(3.2)	5.1	1.9	(2.6)	13.2	10.6
56-66	-	-	-	(0.7)	10.2	9.5

Source: figures derived from Appendices D.3 and D.4

Figures for 1970-75 are based on only 24 companies but suggest the largest class of companies (household names such as Lucas, Dunlop etc), although displaying faster growth, were substantially outperformed by companies in the next three size classifications in respect to profitability. This suggests that some of these larger company groupings, formed from earlier consolidations, have already passed the point of optimum size; certainly market leadership, exercised by most of these companies (in their particular component sectors) merely in a UK context, has proved no guarantee of competitive success.

Figures for the eight year period 1975-82 are based on the full 66 companies. Growth rates are similar, so the issue of "buying market share" does not arise, but the largest class of companies is outperformed by every other size classification. Indeed Table 57 shows how consistently this happened in every year between 1970 and 1978.

Table 57 Average ROCE by size classification 1970-82

	1-11	12-22	23-33	34-44	45-55	56-66	1-66
1982	(2.2)	(6.6)	(0.7)	3.0	(12.2)	(8.3)	(4.5)
1981	(3.4)	(5.5)	4.1	(1.9)	(6.5)	(6.7)	(3.3)
1980	(3.6)	(4.7)	9.3	(4.3)	4.5	2.4	0.6
1979	12.7	10.8	24.2	10.9	20.8	21.9	16.9
1978	15.1	18.7	33.3	15.2	23.1	27.0	22.1
1977	16.1	22.6	36.1	15.0	30.0	33.1	25.5
1976	14.5	29.0	25.9	15.5	22.5	13.3	20.1
1975	10.2	21.5	23.9	10.4	7.4	5.8	13.2
1974	11.8	21.3	29.3	13.3	5.4	-	15.4
1973	12.4	25.1	14.5	22.2	1.5	-	14.7
1972	12.7	24.9	25.1	24.1	(5.5)	-	16.4
1971	12.8	29.6	19.5	25.6	13.4	-	18.7
1970	13.5	34.4	11.3	23.2	10.9	-	17.1

Source: figures derived from Appendices D.3 and D.4

Yet in the last few years this situation has changed and the second largest group has in fact been under more pressure than other groups including the largest. As noted particularly in the cases of automotive forgings and automotive exhaust systems, second tier companies have been squeezed between stronger larger companies as their vehicle manufacturer customers moved to fewer sources of supply (eg Rubery Owen in wheels), and smaller more flexible competitors carrying very low overheads.

This highlights the need for sensitivity to circumstances. Many larger component companies suffered in the 1970's through over-reliance on strategies more appropriate to the growth conditions of the 1960's and through insufficient recognition of the changing radius of competition. In today's turbulent competitive conditions the issue of scale cannot be ignored, but it must be analysed carefully in context.

Table 58 Best performing companies 1975-82

	Growth %	ROCE %	Activities
1. IHW (48)*	(2.4)	67.4	Door hinges, OE
2. Motaproducts (66)	428.7	28.4	Accessories, AM
3. TI Nicholson (53)	0.1	44.8	Exhaust systems, AM
4. Britax Wingard (29)	(2.0)	44.9	Accessories, AM
5. Oldham (27)	1.5	36.1	Batteries, AM
6. Flexible Lamps (62)	5.0	32.2	Lighting, AM
7. Champion (21)	(3.0)	37.4	Spark plugs, AM
8. TI Cheswick (31)	(3.1)	34.0	Exhaust systems, OE
9. Airflow (38)	12.8	15.0	Body panels, OE
10. Concentric Pumps(33)	(1.0)	23.7	Water pumps, OE
11. Intermotor (64)	8.7	17.9	Electrical, AM
12. Cam Gears (13)	(4.3)	30.2	Misc, OE
13. Armstrong (14)	6.9	13.4	Exhaust systems, OE/AM
14. C H Industrials (40)	10.7	9.1	Exterior trim
15. BBA (7)	(2.7)	21.8	Brake linings, AM
16. BRD (17)	(2.8)	21.9	Prop shafts, OE

* size ranks, given in brackets, average 35 for this group

Source: ICC

Table 58 gives details of best performing companies in the period 1975-82 and again confirms that size is no guarantee of competitive success. There also appears to be little correlation between growth and ROCE, implying that increasing market share is no guarantee either.

The group includes a miscellany of products but aftermarket products such as exhaust systems are better represented, confirming case findings of a slightly healthier situation here.

Surprisingly, many better performing companies are involved in relatively low technology activities, which does not support the notion of low technology companies being inevitably doomed. This may be because such activities have so far been less exposed to the impact of international competition. From the viewpoint of UK competitiveness though, it is disturbing that higher technology companies

are not better represented. This again seems to indicate the UK business environment is discouraging more technologically progressive strategies.

Table 59 Best performing companies 1980-82

	Growth %	ROCE %	Activities
1. IHW (48)*	(9.4)	67.4	Door hinges, OE
2. TI Nicholson (53)	(4.8)	44.8	Exhaust systems, AM
3. Concentric Pumps (33)	(6.2)	28.2	Water pumps, OE
4. Flexible Lamps (62)	(6.0)	22.5	Lighting, AM
5. Smiths (4)	(1.0)	17.1	Instruments and systems, OE/AM
6. Rockwell Maudsley (24)	(12.8)	21.1	Axles, OE
7. TI Cox (41)	(6.6)	10.3	Seating parts, OE
8. Oldham (27)	(10.1)	16.3	Batteries, AM
9. TRW Clifford (30)	(10.3)	15.2	Misc, OE
10. Abbey Panels (45)	(5.8)	10.3	Body panels, OE
11. Intermotor (64)	(1.1)	5.5	Electrical, AM
12. Motaproducts (66)	(8.0)	5.5	Accessories, AM
13. Chilcotts (55)	(12.4)	16.2	Exhaust systems, AM
14. Supra (42)	(7.1)	7.8	Materials, paints, sealants
15. Commercial Ignition (59)	(9.6)	10.0	Electrical parts
16. Turner (19)	(3.1)	3.2	Gearboxes, clutches, OE

* size ranks, given in brackets, average 42 for this group

Source: ICC

As noted, however, factors making for competitive success may be changing. Only half of these companies appear in Table 59, which focuses on best performing companies in just the most recent three years 1980-82, and an even greater variety of activities are represented.

6.6 Basic issues facing UK manufacturers

6.61 Productivity

Quantitative estimates of productivity differentials noted in product cases can be taken as a strong indication of a lack of commitment by UK manufacturers in regard to

this issue, but I would not expect such differentials to reflect the situation in all product sectors. Where manning levels are largely process determined, productivity differentials are likely to be lower. Some multinationals, particularly those operating smaller UK plants below about 250 people, have not experienced such large productivity differentials. Also some UK plants perform a "cats and dogs" role, where it is appropriate for productivity to be quite low. (In fact, UK conditions have led to some such plants being closed though in more normal circumstances they have served a useful role.) I would also expect many UK manufacturers to have made further improvements since my visits and would be surprised if much of the more obvious slack has not gone.

From this point on, I suspect improvements in productivity to match overseas rivals will involve a long haul, requiring rapid but sustained progress. Low levels of utilisation and stagnation in the UK appear to seriously inhibit further progress.

Britain cannot afford this situation in the context of such rapid advances by competitors. Evidence of this is ubiquitous throughout the Japanese automotive components sector. Japanese productivity in disc pad manufacture for example had increased from 31 pieces/man/hour in 1978 to 67 in 1982, reflecting the situation in cases discussed. In stagnating, Britain is slipping further behind.

6.62 Quality

Quality was a key factor from the viewpoint of OEM purchasing departments, particularly when buying

internationally. Britain's reputation is better on particular products (eg brakes) where it has been better placed historically. In general however, whilst British manufacturers enjoyed a good international reputation for quality a decade ago, today their reputation is mediocre. By contrast, Japanese component manufacturers had a shoddy reputation 25 years ago, but must now rate as leaders.

Some Japanese companies interviewed volunteered unsolicited comparisons between British and German component suppliers. The German sector's quality standards were considered high and ahead of Britain both by Japanese component companies which had visited and collaborated with both countries, and also by Japanese vehicle assemblers. One British supplier hadn't even troubled to put the right number of parts in the box, a matter of some sensitivity in the context of "just in time" delivery systems.

Multinational parts companies have undoubtedly done a great deal to tighten up quality standards in their British plants in recent years. Even so one quality control manager, monitoring identical parts from plants in Germany and the UK, stated that whilst his average rejection rate in the UK had averaged only 0.1% over the previous two or three years, the figure from the German plant was only half that figure. Tracing the causes, about half the UK rejections were due to faults on items the UK plant had itself bought in, pointing to the fact that British manufacturers were less thorough about passing responsibility for quality to outside suppliers.

Quality standards maintained in Germany and Japan are

assisted by more modern plants, enabling more ordered work flow routes and equipment. The clinical neatness of German factories and of more modern Japanese plants (some even boasting small palm trees along the length of the assembly lines) is in contrast to most British component factories and provides a more conducive atmosphere for quality and other improvements. GKN's extremely modern constant velocity plants in the US have recently won American quality awards however.

German and Japanese manufacturers enjoyed closer relationships with machine tool suppliers whose support is evident in numerous minor technical improvements, tailored to their individual needs. Similarly, quality initiatives pursued by so many Japanese component manufacturers, could be traced back the direct involvement of their vehicle manufacturer customers. The dynamic development of all three industry "tiers", based on close fostered relationships, has been mutual and reinforcing.

German and Japanese approaches to quality, and indeed other manufacturing issues, were distinguished by a different control philosophy. Both UK and US manufacturers relied heavily on externally imposed systems, designed to stop production personnel getting too far out of line with regard to quality standards. There was still a tendency to believe in a quality / cost "trade-off", and "optimised" standards tended to be enshrined in quality control manuals, backed up by sophisticated control systems and higher levels of quality control staff. This also appeared to apply to production control systems.

German manufacturers were not averse to advanced

quality control techniques. One company, for example, had installed a computerised statistical sampling system, and was pushing beyond go-no-go inspection principles common in Britain, by utilising advanced statistical methods in conjunction with specific error data, available from more accurate equipment. Generally though, German and Japanese companies objected to "optimisation" approaches in any area of manufacturing policy, on the grounds that they reduced commitment to a more dynamic learning experience in the production area.

Responsibility was placed more firmly in the hands of production personnel whose morale and involvement was considered crucial. Japan's unique culture may have helped foster the commitment of working groups referred to as "quality circles", but it should also be remembered that its entire cultural tradition had been associated in the 1950's with quality problems far worse than in Britain. What changed was not culture, but a willingness to adopt a new production centred organisational approach together with specific and coordinated manufacturing programmes. As Nissan Motor Manufacturing (UK)'s Personnel Director, Peter Wickens (Wickens, 1985) reiterates, such changes are appropriate to UK manufacturers.

The ideas on statistical quality control put forward by Deming and Juran in the late 1950's and early 1960's found a most receptive audience among Japanese manufacturers initially because of their pressing quality problems. The simplicity of their methods enabled modern techniques of quality control to be placed directly into the hands of

operators, rather than becoming merely a staff function.

This caught the imagination of very large numbers of people involved in manufacturing operations, and encouraged the emergence of the "quality circles" which were ubiquitous in the Japanese vehicle component manufacturers visited.

One example was a small brake linings plant employing only about 30 people. The section leader, a man who had left school at 15 and come up through operations, not only knew about the work of Deming (a US academic!) but also produced a small library of books on the subject, proudly admitting that he had his own personal library on statistical quality control methods at home. The area set aside for his quality circle was almost a shrine, with photographs and diagrams of all the improvements he and his men had produced over recent years: pride of place went to a series of beautifully presented colour photograph albums (one album for example showed eight of this group's major ideas during the previous year). This section leader, like many others in Japan, attended monthly lectures at quality groups outside the factory and about three or four meetings per month took place inside the company. Two "circles" were in fact in operation, one a quality circle which also covered safety improvements and the other a productivity group concerned with other improvements to the manufacturing process. This group's numerous suggestions had generally been implemented and had contributed to a steady improvement in quality standards. The company's records indicated that rejection rates on brake pads had gradually been brought down from 0.68% five years earlier to 0.48%.

Toyota, which claimed to receive about 38 suggestions

per employee per year, is a leading exponent of such schemes and has directly influenced its suppliers. Similar figures for suppliers were high but generally more modest. One brake manufacturer, with about 120 quality circles in operation, averaged just under 5 p.a. though the target was to beat 10 p.a.. This had also reduced the number of quality control staff to only 1.5% of the workforce, which is low for a safety critical product.

Given a favourable organisational context, something that began with quality in mind ultimately succeeded in harnessing the enthusiasm and commitment of enormous numbers of employees, and was extended to a range of other basic production improvements such as productivity and flexible manufacturing methods. Yet it was not the result of some accident or fortuitous circumstance; it was the result of management recognising and supporting such critical developments.

6.63 Research and development

In many component areas, UK manufacturers inherited a strong R&D capability. Often, they had in fact licensed out such know-how to Japanese companies, eg in constant velocity joints, brake linings, brakes and glass. British pistons and fuel injection systems are also technically advanced. In other areas, technological dominance has been allowed to wither away: eg Dunlop's supremacy in tyre technology was lost to competitors such as Michelin, particularly after radial tyres were developed.

UK manufacturers have suffered from a relatively

undynamic market base, and a weak funding position. Most can only afford small R&D departments at best, and even large companies have often been forced to close departments completely during such difficult recent business conditions.

Despite limited organisational support, British R&D staff seem to have maintained a surprisingly good creative record. GKN Forgings' technical developments were still ahead of Japanese manufacturers. Individually, British R&D engineers are better trained and qualified than their counterparts in Japan. Even electronic companies in Japan place little emphasis on outside training or qualifications, though they do gain from strength in depth in terms of graduates with relevant degrees. They are also prepared to increase the number of their staff when necessary. Mitsubishi Electronics spends <> of sales value on R&D in automotive electronics and also receives substantial support from its parent Mitsubishi Motors, <>.

Japanese culture and their managerial approaches tend to be less supportive in this area. Honda's production personnel, for example, were proud that R&D staff were often "not allowed in" and saw their R&D department very much as a service department to develop their ideas. Nevertheless the morale and commitment of Japanese R&D engineers seemed high, sometimes almost matching the enthusiasm of kamikaze pilots. I asked one R&D engineer how they tested brake linings only to be told they were on the car we were driving! Those I interviewed habitually worked a couple of extra hours before going home.

Japanese executives still seemed to respect British technology, but one referred to a UK components manufacturer

he had visited thus: "A good product, but the business isn't so good!".

The key problem facing British R&D engineers is that they lack support in the production area, so that many good developments never get implemented. The changes that have so transformed Japanese component manufacturing have not been associated with glamorous technical breakthroughs (I found little evidence of robotics for example), but have involved widespread incremental production improvements. In areas where R&D will be more important, such as automotive electronics, the Japanese ensure funding and staffing that UK companies will find difficult to match.

There is powerful European competition in R&D. German R&D engineers are even better trained and educated than in Britain. They are supported by enormous strength in depth, extending upwards to Board level and to managers and production operatives. The pace-setters in technological change in automotive bearings seemed to be Germany (process developments and applications engineering) and Italy (eg integrated wheel bearing developments). There is a danger that continental Europe is becoming the main hub of technological development, whilst Britain is becoming stagnant and geographically peripheral. Another example cited recently by the Rt Hon Edward Heath was a new automatic transmission. Its developers reportedly complained that no UK company was in a position to manufacture, partly because of weak funding support from British banks. It is now being manufactured in Italy. I asked an R&D manager from one vehicle manufacturer about the

technological position of UK suppliers. His main worry seemed to be, not that they were technically poor, but that they did not any longer have "developments already in the pipeline" in the same way as German counterparts. This probably reflects a weak funding situation.

6.64 Flexible manufacturing methods

Japanese vehicle companies and their suppliers have worked concertedly together over the last decade to create an overall system, more flexible in handling variability in order patterns, and in dealing with an increasing variety of new products. Whilst Japanese vehicle companies have achieved extremely high volumes on some models, their emphasis surprisingly is on increasing (and upgrading) the number of their models and accelerating the pace of model changes, rather than standardisation. Suppliers have been subject to the same pressure to improve flexibility. Honda's wheel supplier, for example, having built up experience in dealing with the astonishing pace of model changes in motor cycles, was having to push through similar programmes to meet similar Honda demands on the car side. They are experiencing product changes about every six months.

A total "systems" view of the operation is required. Vehicle companies have even found it necessary to advise suppliers of changes required in their distribution and logistical arrangements to meet their needs efficiently. Car seats for example must now be delivered to a particular place next to the assembly line on an hourly basis. They have become involved in quite detailed matters such as getting suppliers to switch to smaller trucks.

After 1979, more difficult business conditions placed a premium on such flexibility. Order runs available to suppliers have been sharply reduced and subject to more frequent disruption everywhere. UK conditions have been particularly bad in this respect, and manufacturers have paid a high price for their failure to pay the same degree of attention to the issue of flexibility.

From an engineering stance, FMS developments that have transformed the Japanese automotive components sector, cannot in general be equated to the more sophisticated robotic systems which now capture the public's imagination. To date, at least, robotics appear to have played a very minor role.

Investment and R&D have played a limited role in these developments. FMS improvements have required changes throughout the entire process route and have been heavily dependent on incremental developments pursued by work groups in production areas. As in the case of quality and productivity improvements such progress has in turn depended on a better partnership with employees and production-orientated organisational approaches, together with numerous detailed engineering improvements. Specific changes involved have been discussed in detail in the two product cases in which they were particularly important: automotive forgings and automotive exhaust systems (5.2 and 5.4).

Such progress appears to have been fairly comprehensive across all components however, reflecting coordination by their vehicle manufacturer customers. The importance of such developments and progress made by Japanese component

manufacturers does vary though. Production methods for components such as volume automotive bearings and to some extent spark plugs are inherently more process determined. It is harder (and perhaps a little less worthwhile) to gain flexibility without incurring too great a cost penalty. Even here there is evidence of similar progress. An extreme example is glass, a process inherently inflexible. Japanese manufacturers had dealt with this problem by adopting a different approach to planning and control. This company was considering selling such expertise to US glass manufacturers who are now facing the problem of supplying Japanese vehicle plants in the USA.

After over a decade of progress, almost ignored in Britain, Japanese commitment to such developments appears unrelenting. As one manufacturer of electric motors put it "Our target production run is one!". Their relevance to UK suppliers was again highlighted by Dunlop's request for state aid reported in the Financial Times (19.8.85, p1). Investment was required because Dunlop saw "new flexible manufacturing systems as the way to deal with Britain's small production runs. The new investment is intended to give the flexibility to change from production of one type of wheel to another within an hour: The normal change-over among volume manufacturers can be 10 to 20 hours."

6.7 Industrial Relations

Strikes are merely an extreme manifestation of poor industrial relations, a symptom of a more fundamental degeneration (sometimes for understandable reasons) in

employees' commitment to ensuring an organisation's continued competitiveness. The power of precedent is such that 90% of the time changes can be disrupted merely through the unspoken threat of such problems. More importantly, though, faced with such dynamic international competitors, an ambivalent or merely passive attitude to change is no longer likely to be adequate to ensure business survival.

My interviews with German and Japanese manufacturers confirmed more general research findings that their strike problems were of a totally different order of magnitude. Asked to remember back as far as possible (10 or 20 years if they could) the eight German component plants visited were unable to produce a total of hours involved in strikes much above 10 hours, with some claiming no hours lost at all. The absence of strikes in the Japanese vehicle industry has been noted by Shimokawa (1982b, p275) as a major factor in the rise of its competitiveness and my interviews confirmed a similar picture in the case of vehicle component manufacturers.

With delivery reliability now more important the wider industrial relations scene is also relevant. The international purchasing department in one German vehicle company pointed out that UK component suppliers were also damaged by fears of disruption in UK ports and transport communications. As a result they tended to either restrict shares of business going to UK suppliers or insist on high levels of stocks held locally, placing an additional financial burden on UK suppliers.

By 1982, US component manufacturers appeared to be experiencing more industrial disputes than UK manufacturers,

whose situation had improved. However, employee attitudes seemed enthusiastic and dynamic in comparison with Britain where morale sometimes seemed at a low ebb. Japanese multinationals were able to negotiate US labour contracts as long as three years, and apart from pressure at such times, few problems arose and the industrial relations atmosphere was considered quite positive. Their main problem was in harnessing employees' longer term commitment and loyalty. US labour turnover figures were high. Often employees, repressed any feelings of discontent and would merely leave the moment a better job opportunity arose.

NSK (as discussed in 5.1) had a high regard for UK employees and did not feel industrial relations was a problem. Their UK plant had though been set up on a green field site basis, top managers were Japanese, and they had only employed people under the age of 28, whose attitudes were felt to have had less opportunity to become encrusted by past conflicts. Japanese ideas on employee participation were generally transferable, though progress on quality circles could only be gradual anywhere and UK employees lacked experience.

German executives in one multinational had deliberately trained some UK production workers in Germany. There was no difficulty in achieving German performance standards, but when these operators returned to the UK plant, their performance (which was monitored) slumped back to UK norms. NSK also stated UK production workers matched Japanese standards on training, but they did not experience this problem.

Prais (1981) has argued that British industrial relations problems escalate mainly as plant size rises above about 250 employees and NSK's UK plant was a little below this size. One German executive made the same point. Industrial relations were not a problem in his company's UK plant, but they were conscious of the need to keep down plant size in Britain below about 500 employees, after which problems escalated.

Both German and Japanese executives who had dealt with British companies were critical of British managerial attitudes towards employees. These were felt to be divisive and myopically exploitational. Executives in both countries emphasised their responsibility to safeguard the interests of employees, particularly in terms of continued employment; in the absence of such a commitment by management, they believed it was impossible to secure consensus and employee commitment on any long term basis.

In Germany, this commitment was in part formalised, through works councils and worker representatives on higher tier boards in larger companies, but the attitudes of German managers seemed very different. One German superintendent was an active campaigner on behalf of employee interests and also had formal duties in this capacity. In terms of any "them and us" it was clear that his identification appeared to lie more with employees than the company. Neither he nor senior management considered this in any sense unusual or out of order. One chief executive reminded me that even before the last war the attitude had been "we are all workers, even if some of us work with our brains rather than our hands". Any residual class differences he felt had been

levelled in the common experience of reconstruction from almost nothing after the War. Another executive commented on the rapid turnover of British executives he dealt with compared to the situation in mainland Europe generally. He had the impression that British employees were judged more on whether "their faces fitted" than on their ability to do a job. The perceived divisiveness of British boardrooms, and in particular separate dining facilities, was criticised by German and Japanese executives alike.

Japanese executives criticised the shorter term, more contractual, relationships between companies and employees in Britain and America, and the tendency for employees to be laid off the moment it was convenient. As with assembler/ supplier relationships, such an exploitational relationship would inevitably cause employees to hit back and exploit the situation when conditions improved. Such conflict damaged consensus and undermined employees' commitment, their training and career development.

Though I visited only a few small Japanese plants and their "tertiary supplier sector" was not fully represented, virtually all suppliers visited appeared to operate lifetime employment schemes. To safeguard employment companies were prepared to bring back work in-house or even, sometimes, to take on work outside their normal ambit (as in the case of exhaust systems manufacture discussed in 5.4). Market targets were fought for tenaciously. When work was slack, employees were taken off production lines and recruited into improvement groups. One factory visited had almost 60 people in such groups. "We can use their brains not their

hands for a time", they said, "but when demand rises they will return to the lines."

Such policies were financially viable because the partnership with employees was two way. Wage bonuses, which were high, could as in Germany be reduced in difficult conditions. With such commitment the supply side of the Japanese economy was clearly in shape to sustain higher non-inflationary growth rates, mitigating unemployment problems more generally.

Greater commitment by UK management and employees to a genuine two way partnership will be essential in restoring competitiveness in the longer term. NSK's experience in the UK and Nissan's agreement with the AUEW suggests that this is feasible.

6.8 Organisational issues

Japanese executives also attributed their success to an organisational approach which contrasted with that of many Western companies. The president of one component company appeared to confirm the popular view of decisions frequently being "bottom up" rather than "top down". "Yes", he said, "it makes my job very easy!". Other executives, however, clarified that it was very much a two way process. Senior management is anything but passive, as illustrated by the entrepreneurial influence obvious at Toyota and Honda.

Surprisingly career appraisal systems were also two-way. An accountant from a large Japanese component company, seconded to the British operation, compared the situation in Britain and Japan. Company policies were similar to those of other large Japanese companies. In the context of

lifetime employment, career development was regarded as very important and appraisals occurred twice a year. Though his salary is little affected, assessments make the difference later between advancement and being shifted into a backwater. Like most of his Japanese colleagues he works an extra couple of hours most evenings. "No one wants to get left behind."

Such appraisal systems are fairly common in larger UK companies, but he was puzzled to find no equivalent of the second part of his company's assessment system. For he, in turn, is required to complete a standard form for his personnel department, the first questions after standard entries being broadly:

* How good are communications between you and your boss?
* How good are communications between you and other colleagues?
* Do you have any problems with your present work?

He felt the British system was perhaps unfair, since without this system there was no feedback coming from those lower down the organisation. Any comments were bound to be a little veiled, but his personnel department carried considerable weight because they influenced his manager's next career move.

The Chief Executive of Allied Steel and Wire, a UK steel supplier which has worked closely with the Japanese, also emphasises the vast number of reports Japanese personnel departments received on even low level managers, from bosses, colleagues and subordinates. He feels that

British managers compare unfavourably with those in Japan, but that critical managerial qualities can only be assessed on the job. The Japanese system, he says, ensures poor managerial ability gets spotted early on. Even large companies really know their staff over years of career development and can ensure that only those with the right qualities rise to take responsibility for others.

Academics in Japan such as Shimokawa and Ballon distinguish "groupism" rather than individualism as lying at the heart of Japanese approaches to organisation, education and training. Ballon acknowledged Japanese businesses displayed little interest in the content of university courses. Such courses were not even particularly intense, since at this level they wanted to encourage group cohesion rather than pushing individual competitiveness too far. Japanese companies took little interest in outside training courses and rejected the concept of professions such as engineering and accountancy. This was felt to encourage identification with individual goals, rather than identification with the working group and with the goals of the company. This was perceived as creating divisiveness and damaging to consensus, a luxury companies felt they could not afford. (This may explain why Japanese engineers interviewed were generally less well educated and trained than those in Britain).

The personnel manager of a major Japanese supplier illustrated the change in orientation required. Some years earlier they had identified a technological gap emerging between themselves and another Japanese competitor. Having determined that their own technical staff differed very

little in either background or ability from those of the competitor, they traced their problem to a lack of support from production personnel. They found their professional staff were so "swamped" with resulting problems, that they had little time to carry out the numerous minor changes which were putting their competitor ahead. The solution had involved a radical reorientation, making production operators themselves the focus of attention, and training resources had been accordingly redirected.

Their changed orientation, in fact, closely mirrored the fairly extreme production-centred organisational approaches advocated by vehicle companies visited, particularly Honda, Toyota and Mitsubishi. The same approach had been adopted by suppliers visited. It was reflected in the status given to production workers and also pay. Engineers working in production were paid on precisely the same scales as accountants or salesmen. (Age and length of service were the main determinants of pay and status, with billboards outside factories proclaiming the names not of directors but of long service workers).

The organisational contrast in both UK and US plants of one multinational company <> was marked. It was more advanced, particularly in the USA, than its key Japanese competitor, which I also visited, on "systems" operated by staff functions. Financial, production and quality control systems were sophisticated, highly detailed and utilised advanced computerised information systems; by contrast Japanese "systems" mainly comprised extensive simple control systems of the type discussed in section 5.

This multinational's performance was in many respect impressive. Financial performance was well above average, its international strategies had been aggressive and timely, and it was technologically well advanced. Nevertheless they were concerned with the strides their Japanese competitors were making in the area of production.

Self confidence and morale in Japanese production areas were high and there was indeed ubiquitous evidence of progress (similar to that discussed in other cases in section 5). By contrast morale in the UK plant's production areas was poor and production management seemed swamped by externally imposed systems. I asked supervisory staff what happened to voluminous computer printouts of quality records after filing. "It's pretty rare that anyone comes down here to use them," they explained, "so eventually they just get thrown out to make room for more recent printouts."

Authority for handling industrial relations had largely been transferred to the personnel department. Supervisors complained they could "never get an answer" from such distant staff departments. Left with resultant problems, they themselves felt undermined.

Production management felt excluded from the chief executive's full support. They could not help noticing they said, that on his visits to the shop floor he would walk straight past them without even greeting them; instead he would regularly seek out the shop steward asking solicitously after his health condition. Junior production management felt hurt and excluded by the staff/hourly paid class divide in their organisation, which left them despite their considerable responsibilities on the wrong side of the

fence. Whilst they were not invited to the plush yearly staff dinner dance, the seventeen year old girl student who served their tea was. Such stories are not rare in British factories, but here there were also signs from the staff side of the same divide.

<>Senior staff did not seem to recognise that production personnel needed greater support and authority so that they could be rebuilt as a strong team. This alternative approach appears to have assisted Japanese manufacturers to transform their competitive position over the last twenty years.

The point echoes fears that Western management philosophies may have downgraded the contribution made by production personnel (Garvin, 1984). One US car worker was said to have understood that he had been laid off because the Japanese had got ahead on quality, but was left perplexed by the fact that in twenty years no one had sought his opinion as to how it could be improved.

Organisational changes, similar to those implemented in Japan, must be taken more seriously by UK component manufacturers.

6.9 The Approach to Strategy

6.91 The UK planning environment

The UK business environment, discussed in 6.3, has been so severe that planning horizons were necessarily shortened to preserve financial control. It has also been subject to more extreme fluctuations than Germany, Japan and America. German executives with experience of Britain pointed out

that, whilst production forecasts from German vehicle companies provided an accurate basis for planning, such information in the UK was unreliable even a few months ahead. The German sales office in one company claimed to have been within 1% of sales budget forecasts in each of the previous five years. Close customer relationships in Japan and to some extent Germany encourage an almost logistical approach to business planning.

6.92 The lack of analysis of strategic issues in the UK

Although remaining competitive was a matter of survival for many UK manufacturers, few outside the very largest companies seemed to have much idea of who their main competitors were (even in the UK). Fewer had the data which might logically have highlighted key competitive issues. In smaller companies, sales and financial records over five years old were often not stored in any accessible manner. Very few companies had had much time to draw conclusions from any competitive data they did have. Often the only people with much knowledge of the competitive position were marketing or sales staff, and many chief executives seemed preoccupied with day-to-day operating matters.

Yet since it is largely competition which holds down profit margins, unless such issues are analysed more effectively, manufacturers seem destined to remain "fire fighting" and at the mercy of competition which will continue to intensify relentlessly. UK manufacturers generally need more knowledge of key UK competitors and increasingly (particularly for larger manufacturers) a

knowledge of key European competitors. Information sources available on continental Europe are a handicap: this most critical area is much more poorly documented not only than the UK, but also than other trade blocs such as the USA and Japan. Manufacturers also need to know more about Japanese manufacturing methods. Since competition with Japan is mainly indirect, there would seem scope for technological transfer agreements.

6.93 Generalist approaches to strategy in Britain

Mant (1979, pp95-100) has criticised what he regards as the "generalist" predilliction characteristic of British management. In comparison with the Continent, British boardrooms are too dominated by those with accountancy backgrounds, "as if the primary task of industry was laundering money, with production as an irksome constraint rather than vice versa". He argues that functions such as accountancy, personnel, and those of other head office specialists and even marketing are frequently peripheral to the key problems of British industry. These are seen as being in the production area, and in the tendency for production to be treated as a "Cinderella" function.

In the context of the UK vehicle components industry, section 6.8 found some evidence to support the organisational implication that there is a need for a more production-centred approach. Mant's argument that "breadth of vision" must be complemented by "a meticulous eye for detail" is also applicable to effective strategy thinking. It implies that UK managers need to achieve a better balance between general concepts of analysis and more specific

issues of key contextual importance (particularly in respect to basic issues such as production). To take an analogy, there has been increasing recognition that for British "Research and Development" to be more effective, the emphasis needs to be as much on the more "applied" Development as on the purer Research. The latter may be of more general interest but is often of less contextual significance.

Case studies discussed in section 5 indicate a similar need for analysis of more general issues to be balanced against more specific issues, often in the production area. A characteristic of UK component manufacturers' strategies appears to be their generality.

The most common strategic theme among UK component manufacturers has been retrenchment and rationalisation. Traditional accounting policies were cited for example by Automotive Products' chief executive as having become the top priority. Other manufacturers faced with such a severe decline in profitability have shared similar priorities - control of fixed and working capital, particularly cash flow and a quick resumption of ROCE, if necessary by cutting out marginal activities. This general emphasis on retrenchment and rationalisation has been reflected in a widespread tendency towards unprecedented charges on extraordinary and exceptional items taken "below the line", eg RHP, GKN and Lucas.

Such strategies may be necessary given the UK's situation but they are essentially defensive and by no means sufficient, if manufacturers are to regain competitiveness

internationally. Such retrenchment is less characteristic of better performing overseas rivals such as the Japanese, though some US component companies have also suffered.

UK manufacturers have also displayed a greater dependence on general strategies such as diversification, acquisition and mergers than their counterparts in Japan and Germany. Frequently these strategies have been defensive. They have perhaps helped manufacturers cope with competitive decline; but so far they have not represented effective countermoves against overseas competitors.

UK manufacturers often seem overstretched in the context of increasing international competition. Yet diversification, weakening core business areas further, seems of greater interest to UK than to overseas manufacturers. Such strategies often seem to have done little to restore international competitiveness. For Dunlop, once preeminent in vehicle tyres, diversification may have produced some new activities, but at the inordinate cost of surrendering its core business area of tyres. Its wheel production (discussed in 6.1) also seems on the brink of collapse unless government money is forthcoming. These automotive activities took years to build up; the value of its smaller new activities cannot be judged until they have withstood the test of competition. Such a loss of world leadership in automotive component sectors cannot be rated as an effective strategy approach.

This is not to suggest such general strategy issues are never important, only that effective strategy thinking involves their being interpreted sensitively in context. Scale for example raises important strategic issues for many

UK component manufacturers, particularly as business competition becomes more international; but those who have relied unduly on volume orientated approaches without adequately taking into account their competitive context and circumstances appear to have suffered disproportionately.

What many UK manufacturers have failed to do, in comparison to overseas competitiors, is to recognise the strategic significance (in their particular context) of many basic issues, particularly in the production area (as indeed suggested by Mant).

6.94 Overseas competitors' emphasis on more specific matters

Despite the popularisation of their strategies in more dramatic terms (such as "laser beam marketing"), Japanese competitors in this sector shared with German manufacturers an aversion to general strategy concepts, such as portfolio approaches. This was partly because their business environment and the structure of Japanese business discouraged major moves such as diversification and acquisitions. They therefore seemed to find it more profitable to focus instead on basic issues and on creatively developing their "own patch of grass", with a longer term orientation. Their close relationships with vehicle manufacturers encouraged this and also induced an almost engineering approach to planning.

Whereas strategic planning in UK companies tended to be heavily financially orientated, in Japan the emphasis seemed to be on key market targets, expressed in quite simple

terms. Attention then focused on fairly numerous "physical targets" aimed at bringing about improvements necessary to attain these market targets. One Japanese manufacturer's approach was discussed in section 5.4. Financial targets (such as ROCE) and budgets were not ignored, but cost reduction and profit projections appeared mainly derivative and could be summed up fairly simply.

The contrasting situation in one UK company seemed to epitomise the danger of applying the general approach to strategy suggested by Argenti (1980) superficially. Here the process worked the opposite way round. Financial targets were set and translated into more detailed (though still largely financial) targets. Fairly minor amendments were made to existing operating plans. For example, if the general view at the top was that cost levels would have to be lower (to meet targets), this was translated into more optimistic productivity assumptions, with an accompanying budget amendment for increased capital investment to pay for more equipment, creating the impression at the end of the planning cycle of a coherent overall plan. Production issues inevitably received superficial treatment, whilst detailed financial projections produced an illusory sense of control; real control requires that competitors are matched on key developments.

Asked to comment on their strategies, German executives emphasised specific developments but were reluctant to make general assertions. Like the Japanese they tended to avoid standardisation, preferring to maintain a customised service even where this involved additional costs (such as for applications engineers).

German companies were distinguished by the importance attributed to technological developments - process design and development, product developments and applications engineering and also "know-how". Some companies felt their slim top tier of executive officers (often only about three people) produced better communications with engineering staff in design, development and production. One chief executive felt cosy British boardrooms tended to lose touch with technical developments critical in his industry: "Your Boards don't have any designers on them at all, do they?". The managerial structure also helped German chief executives maintain tight communications with others such as salesmen.

One German chief executive held strong views against over-theoretical approaches to business strategy. These he felt often involved misleading notions of optimisation. This was illustrated by his company's rejection of optimisation ideas based on supposed trade-offs such as between cost minimisation and quality. His philosophy which extended to business strategy was based on the "80% rule". By focusing on specific practical proposals and pushing ahead as fast as possible, even if he eventually proved not to be quite on the right lines, he maintained crucial advantages in decisiveness, implementation and flexibility. The attitude seemed to reflect Ackoff's view (Ackoff, 1981) that companies should prepare for a future that is anyway uncertain by maintaining a flexible stance strategically. It also seemed to reflect some of the paradoxes noted in successful strategies by Peters and Waterman (1984). Resources could possibly be wasted though. German brake

linings companies interviewed held varying and quite contradictory views on how to organise international operations in the face of recent developments.

US companies were distinguished by a more "scientific" approach to planning, and by an emphasis on top down control systems monitoring progress against such plans. There was much greater interest in broader strategic issues such as how to play the more global competitive game.

Yet their style appeared dynamic, positive, highly competitive and refreshingly open. Many executives had noted advances made by Japanese manufacturers and acknowledged they had perhaps neglected developments in the production area, where traditionally they had been strong. They recognised the importance of developing employees' potential. Employees too were prepared to make sacrifices and US manufacturers seemed determined to fight their way back to the number one position in the world.

Any generalisation is dangerous. Yet the approaches taken to strategy by UK component manufacturers broadly seem to reflect the weakest feature in US approaches - their tendency (in comparison with German and Japanese manufacturers) to neglect critical production developments. This is paralleled by a tendency to down-value the strategic contribution of production personnel. UK manufacturers would do better to imitate the real strengths of US companies, their positiveness, their openness, their willingness to make sacrifices when necessary, and their decisive commitment to fighting their way back to the number one position in the world. In the absence of such competitive commitment, American management techniques such

as financial analysis, seem to have merely taught UK manufacturers how to control a steady process of decline, the costs of which have begun to be reaped.

7. Conclusions

7.1 Unprecedented decline reflects a strategic problem

By 1983, UK automotive component manufacturers' performances in terms of sales, output and profitability had declined to an unprecedented extent. Decline has been remarkably comprehensive, affecting even automotive component sectors displaying more attractive opportunities. It has been sustained but cannot merely be explained by the downturn in the business cycle: any natural improvement in the immediate upturn will provide little leeway for further British complacency. The issue cannot be discarded as merely an automatic knock-on effect from the decline of the UK vehicle manufacturers, though the competitive prospects of suppliers and their UK customers are highly interdependent; rather, it reflects more fundamental problems in the competitive capability of UK industry.

7.2 Business competition has become more international

A critical problem facing Britain is that the impact of more international patterns of business competition, having increased steadily over many years, has recently intensified.

7.21 All manufacturers have been indirectly affected

Even those UK component suppliers who were shielded against competition through direct trade, were severely affected because UK vehicle manufacturers, themselves under intense pressure from international competition, had to insist on a radically more competitive supplier service.

Their changed bargaining position placed suppliers under enormous pressure to comply.

7.22 The increased impact of direct international competition, though influenced by logistical factors, has largely been related to market and technological opportunities associated with particular components.

The more direct impact of competition from overseas automotive component companies, though generally increasing, has varied according to the characteristics of particular components. For components suited to international trade and competition, such as bearings, the critical arena has moved from being predominantly UK only twenty years ago, to one in which there has already been intense pressure for rationalisation within Europe, propelled in turn by yet more global competitive pressures from Japan and to some extent the USA.

In other areas, such as automotive instrumentation, technological and market opportunities are now rapidly breaking down what has been until the last five years an essentially UK pattern of competition. A rapid transition to real and effective competition within Europe is already happening, and within five years global competition including Japan and the USA will begin to make a substantial impact.

Some components' logistical characteristics or their requirements for close customer liaison provide greater protection against competition through overseas trade. Even here multinational vehicle assemblers have pressured many

component companies into providing local manufacturing support overseas. Thus although the radius of competition between plants is still predominantly UK, that between component companies has become more international. This has happened with exhaust systems, where transport costs are relatively high in relation to value added, though here the impact of direct competition from beyond Europe is unlikely to be significant for many years. This case also illustrates that so long as market opportunities are reasonably attractive, the absence of exceptionally high levels of technology or volume advantages does not preclude internationalisation.

However some areas characterised by fairly limited market or technological opportunities have been partially sheltered from direct international competition. This is particularly so for more customerised products and where production runs are low, such as lower volume automotive forgings. In automotive forgings limited opportunities do not yet justify companies acquiring overseas manufacturing operations and trade is also inhibited by unfavourable transport costs and some need for liaison with vehicle manufacturers. Even so UK manufacturers cannot afford to ignore the strategic implications of direct European competition in volume automotive forging markets.

Perhaps the major factor inhibiting internationalisation is close, often nationalistic ties between UK suppliers and customers. A critical problem facing UK component suppliers is that UK vehicle manufacturers appear to be "opening up" to overseas suppliers more rapidly than is the case elsewhere. Both

need to give greater recognition to the dangers inherent in this situation, and to their long term interdependence.

7.3 An unfavourable business environment in the UK has damaged this industry's international competitiveness and so contributed to declining performance.

An important factor largely outside the direct control of either UK vehicle manufacturers or their suppliers has been the exceptionally unfavourable UK business environment, brought about primarily by upward pressure on real wage levels. In the context of monetary and fiscal restraint, and North Sea Oil revenues, such continued pressure resulted in an unprecedented decline in this industry's international cost position. The same pressure appears to have substantially reduced profitability of both UK component suppliers, and vehicle manufacturers. I suspect businesses in the economy more generally also responded to similar pressures by cutting back and that this contributed to market decline, making matters worse.

Such economic choices in the UK have directly rendered many UK automotive component manufacturers internationally uncompetitive, thus effectively "pricing them out". Such an unfavourable business environment has also inhibited and discouraged manufacturers from pursuing more positive strategies orientated to long term competitiveness.

7.4 UK manufacturers' insensitivity to key contextual issues has also contributed to competitive decline.

Much of the responsibility for competitive decline must

however rest with top management in UK companies. Decline reflects a weakness in their capability to recognise and conceptualise the competitive threat, so as to respond proactively and effectively, rather than merely under pressure of events.

7.41 Given more international patterns of direct competition many UK companies placed undue reliance on volume orientated strategies, especially since they were weakly supported overseas.

A number of important UK companies appear to have placed undue emphasis on benefits anticipated from greater production volumes or from increased market share. This has generally been associated with industry consolidation, rationalistion programmes and volume orientated manufacturing processes.

In the case of components where volume benefits were more pronounced, initial benefits such as cost reduction and increased market power were gained at the expense of entering into more direct competition with powerful overseas companies, better supported to pursue similar benefits in an international rather than a merely domestic context. As a result of the increased impact of international competition (particularly in volume market segments) and the relatively weak position of most UK manufacturers overseas (particularly in Europe), such volume orientated strategies have generally degenerated into an extremely expensive process of market retreat and retrenchment. In such situations, UK manufacturers wishing to pursue benefits deriving from volume will generally require much more

substantial international support: in the majority of cases this would have to involve major international linkages, often even at the cost of some loss in independence.

In some areas, such as automotive forgings, technological and market opportunities have been very limited, and manufacturers have not found it worthwhile to introduce international operations. Yet even for these products, whose high transport costs would not seem to encourage international trade, the impact of overseas competition cannot now be ignored in volume market segments. Many UK manufacturers here had anyway placed undue reliance on volume orientated strategies. Volume benefits are relatively low for these products and vehicle manufacturers' changing needs have recently placed a greater premium on flexibility. Problems were seriously worsened by increased overseas competition, and the performances of these UK manufacturers have been particularly poor.

Finally in the context of more international patterns of business competition, many UK component companies have tended to become too stretched on too many fronts; as a result inadequate commitment has exacerbated problems in core business activities.

Such problems reflect poorly on the ability of senior management in the UK to respond sensitively and effectively to the strategic implications of the issues of volume and of the changing radius of competition.

7.42 Inadequate attention to key production issues

More successful manufacturers, particularly those in

Japan, recognised the strategic significance (for this industry) of a number of basic production issues. Management then pursued such matters demonstrating unparalleled levels of commitment, recognising progress could not be treated as "just an operational matter".

In contrast many UK manufacturers have, over many years, allowed themselves to fall substantially behind (from a position well ahead) on basic manufacturing issues such as productivity, quality, and the ability to respond flexibly and efficiently in the context of vehicle customers' sharply fluctuating demands (particularly in relation to "just-in-time" developments). The result has been a substantial and widening performance gap against international competitors.

Having gradually allowed such a competitive gap to emerge, UK companies were totally vulnerable as international competition intensified. Having effectively lost control of the underlying competitive situation, many companies have only sustained financial control over a sharply deteriorating situation through unprecedented recourse to retrenchment at very considerable cost. Many companies have also taken recourse to fairly defensive and sometimes rather simplistic strategies.

If more basic issues, so critical to competitive success in this particular industry, are not addressed with appropriate commitment, continued "competitive retreat" in the market place is inevitable, and a high price will continue to be paid by everyone concerned.

The fact that senior management have found themselves in the position of having to "fire-fight" such problems in an operational time perspective, is itself a reflection of a

deficiency in their strategic management capability. Unless this is improved, such a situation will become chronic and self-perpetuating.

7.43 People issues

Progress in such production matters depends upon harnessing the positive and total commitment of personnel in production areas. Managerial approaches (and the stance of many unions) in the UK often appear to be a serious stumbling block. Attitudes to employees (as, in the past, to UK vehicle manufacturers) frequently have not been orientated to achieving a genuine two way partnership, so actively pursued and evident in Germany and Japan. Industrial relations have been allowed to see-saw, with managers and unions taking advantage of each other, as bargaining positions altered with the economic cycle.

The difficulty of the situation in the UK may have necessitated unpalatable decisions on redundancies, but industrial relations too is not an issue senior managment can afford to "fire-fight". Management, too weak to grapple with its own deficiencies, can generally still restore temporary financial stability through sufficiently ruthless resort to redundancies. There is now a need to restore employees' trust that such a recourse will remain the last possible resort, not only in a short term operational perspective, but also in the context of the longer term strategic direction, which it is the function of senior management to provide. It is a failure in this latter sense that appears to have precluded that degree of union and

employee loyalty and commitment necessary to reestablish competitiveness in the longer term.

In the absence of a more participative atmosphere, problems have been further compounded by senior management's reluctance to delegate commensurate power and authority to those lower down the organisation in the production area. Until this organisational issue is rectified, efforts by UK staff departments will continue to be "swamped" by the sheer volume of incremental changes required to catch up with competitors.

What is required is for management to identify much more cogent and positive strategies, designed to re-establish long term competitiveness. These, in the context of a willingness by management and employee representatives to form a new partnership, could reasonably command that degree of commitment at all levels which will be necessary.

7.44 Weak relationship with UK vehicle assemblers

UK vehicle manufacturers also have a positive coordinating role to play in such production developments (particularly in respect to just-in-time arrangements). This might have to involve production engineers, linked to the procurement departments, going into suppliers' factories, rather in the manner of supplier visits by Marks and Spencers quality inspectors. In the long run, it is in the interests of component suppliers to "open their doors" to vehicle manufacturers.

The relative independence of UK component manufacturers may once have been an advantage. Even until recently they could achieve profitability levels above those of UK vehicle

manufacturers. This unusual situation has inevitably and irreversibly changed. Both UK vehicle manufacturers and their UK suppliers can now be seen to have both been damaged by the relatively weak and distant relationship that has existed between them. The move to longer term contracts is only one step along the way to a better partnership.

7.5 The threat to this industry's future is urgent, and demands a coordinated response from those responsible at a number of levels.

The competitive situation of the UK automotive components industry has declined to the point where much of the industry's long term future is in jeopardy. The situation continues to decline in relative terms against progress achieved by international competitors.

The precise nature of the threat which this poses depends on product characteristics. For products particularly conducive to international trade, the whole future of any substantial UK manufacturing capability is potentially under threat, as is the case in automotive bearings. UK vehicle manufacturers' requirements for many other products (such as automotive exhaust systems) will continue to be manufactured in the UK, but the survival of many UK companies is potentially threatened in the context of European rationalisation. There are also products, such as automotive forgings (particularly on smaller order runs), sheltered both by factors unconducive to trade and by limited technological and marketing opportunities. Here the threat to UK companies is less a matter of survival; but

unless the threat is countered we can expect a repetition of dismal profitability, retrenchment and unemployment.

Any final solution will have to entail a more united and committed response by all parties responsible for past decline.

Government has the primary responsibility for ensuring a more conducive business environment. Yet its room for manoeuvre has been very seriously curtailed by the pressure on real wage levels, this being primarily the responsibility of trade union representatives and employees themselves in the economy generally.

The literature from classical economics indicated competitiveness could be improved, if people were prepared to forego some present consumption so as to make room for increased investment. Yet in Britain, by contrast particularly with Japan and the USA, pressure on real wage levels (which still shows little sign of abatement) has curtailed profitability and so reduced not only growth in the visible capital stock but also less visible ploughback into activities (such as engineering) crucial for modern business development.

Without contradicting classical economists on this point, Keynes clarified that willingness by employees to allow real wage levels to fall, though a necessary condition for recovery in output (and thereby employment), may not be a sufficient condition in the context of unstable elements inherent in modern economies. Recession though merely leads to some short term intensification of competition, providing the opportunity as well as the necessity for companies to carry through adjustments, sometimes overdue. So long as

the upturn does not result in the illusion that fundamental competitive problems have vanished, encouraging further complacency, benefits may even outweigh the costs. Yet the effects of such instability in the economic system (worldwide as well as UK), superimposed on longer term trends reflecting the competitive situation, do appear to have been particularly marked in 1980. UK manufacturers noted simultaneous contraction in almost all component markets (not only automotive), and many were able to pinpoint March/April as the period when "the bottom fell out of the market". This suggests a step-down process of contraction as envisaged in Keynes' multiplier effect, the position evidently having been worsened by destocking. The original cause appears to have been the 1979 oil price hike, removing aggregate demand and reducing real wage levels compatible with full employment; but such sharp contraction was exacerbated by the government's tighter fiscal and monetary stance, in the context of North Sea Oil revenues and continuing wage increases. If pressure on real wage levels were finally to abate, there would be some leeway for government to assist the demand situation, without the benefit merely being destroyed by accelerated inflation.

Yet even these changes, though necessary, will not be sufficient unless UK manufacturers themselves can improve their strategic management capability and so respond with greater competitive commitment than has been displayed in the past. Any increased willingness to make necessary sacrifices will be wasted if manufacturers merely take advantage of more conducive business conditions to let up

their own efforts or to postpone difficult decisions.

It is management's task to be sensitive to changing circumstances, so as to ensure resources are not dissipated through wasteful endeavours or through neglecting issues of key importance. A further responsibility is direction and leadership. Yet nothing can be achieved in the face of such powerful competition without the support and unqualified commitment of employees and their representatives.

The interdependence of automotive component suppliers and vehicle manufacturers makes it also important that both achieve a closer relationship in the future. UK vehicle manufacturers need to play a key coordinating role in any strategy aimed at reviving the competitiveness of UK vehicle component manufacturers.

Despite underlying problems, immediate market prospects for the industry must again improve as the next cyclical upturn in the world vehicle industry takes place. There appears to be no case for complacently abandoning yet another major business sector; but neither is there any scope for complacency if this sector's future is to be safeguarded. The question is whether all parties in Britain will respond, by altering past choices that have inevitably led to present problems, in time to meet future intensification in international competition, in future cyclical downturns.

7.6 This calls for a wider and more balanced understanding of the issue of UK competitiveness.

Though often discussed in unidimensional terms, competitiveness is not merely a problem of economics or of

any other single discipline The danger is that either the problem is seen as someone else's or that other people's contributions become downplayed.

There is also a danger of discussing Britain's competitive problems at too high a level of abstraction. Many of the key issues highlighted in this study are highly contextual. They would not be the same for all economies, for all business sectors, or for all businesses. General principles, either of economic management at a macro level or of financial analysis at the company level, tend to be more orientated towards restoring stability or control. Yet control over the situation, against a backdrop of continued decline, is not enough. Unless key contextual matters are dealt with, any sense of control enables people to defer more intransigent matters. In the long term such "control" will anyway prove illusory once competition inevitably intensifies. What is needed is a better balance in strategic thinking between general principles and more practical, more "applied" analysis. This would also entail a greater sense of purpose and competitive commitment. The principle of competitiveness cannot be allowed to be submerged in analysis that is either too theoretical or so detailed that it is impossible for people to see the way forward.

However, whilst this study suggests more general conclusions, it remains but a study of a single industry. Yet the methodology used in this study, whereby wider conclusions are drawn from selected product case studies, is extendable. In conjunction with similar studies of other

selected business sectors it would be possible to achieve both a deeper and a broader understanding of this critical issue.

Confronted with realities, the financial and human costs, Britain must surely seek to escape the myopia which has contributed to competitive decline over the best part of a century.

APPENDICES

Appendix A.1

Questions to Manufacturers Regarding Developments in the Exhaust Systems Business

This is part of a more general study of developments taking place in the business of vehicle component manufacture. The main focus here is parts for cars; however as the intention is to obtain a broad view the sector so attention is also given to commercial vehicles and the aftermarket. Other vehicle components being examined are: automotive ball and roller bearings, forgings, automotive electronics and brake linings and pads.

A. Defining the business and "locus of competition"

1.i) Which markets during the next five to ten years will be the key to continued U.K. production of vehicle silencers, firstly with respect to original equipment (OE) market and secondly with respect to the aftermarket (AM):

a) the UK

b) the EEC

c) Western Europe outside the EEC

d) the USA

e) the rest of the world.

Please assign rough proportions as to the degree of their importance and add any comments.

ii) Would this situation have looked different in 1970?

2.a) Which companies do you regard as your key competitors, firstly with respect to the OE market and secondly the AM?

b) What differences would there have been ten years ago?

c) What differences do you think there might be if you were reassessing the situation in 1990?

3. Would the answers to questions 1 and 2 be appreciably different for different sections of the vehicle parts business eg car versus commercial vehicle parts? If so please indicate where this would significantly affect answers given in 1 and 2.

B. The level of economic operations

4.a) Which costs do you consider as fixed rather than variable for vehicle silencers and is this significantly affected if a longer term view is taken?

b) What roughly are the proportions of fixed / total costs?

c) Which types of employees represent fixed costs in the sense that the numbers needed vary little with the volume of sales, and what rough proportion would they represent of total numbers?

d) What break even levels are typical in the vehicle exhaust systems business?

e) How integrated is production? ie If sales fall off, how far is it possible to close down just part of your capacity (as happens in "modular" industries such as forgings where individual presses can be closed down without detriment to the rest of the operation) as

opposed to a sudden decision on whether to close down a complete factory (as tends to happen in more "integrated" industries such as castings)?

5.a) Do you consider there is a minimum level of operations for firms if they are going to be able to remain competitive in the longer term?

b) If so how far is this determined by there being a minimum level of either physical assets such as plant and equipment or of "hidden assets" in terms of engineering support (to keep up with innovation by competitors in products or processes), of sales support in terms of technical back up, negotiating power, distribution outlets, maintaining a full product range, or funds to support sales penetration into fiercely competitive markets?

c) Please add any other factor you consider important.

d) What sort of price advantage would a foreign competitor need to break into your market (other things being equal)? What would be the effect of a change of say 10% in the exchange rate on your ability to either export more or to resist more effectively imports from overseas?

e) How important are scale economies in your industry? ie If you were able to operate at twice the volume by what proportion would your unit costs fall? More subtly how important are experience curves? ie How far does accumulated experience gradually enable you to bring down unit costs?

C. Implications of technical developments

6.a) What rough proportion of first your OE and second your AM sales come from products introduced or significantly changed in the last five years? Is the rate of new products being developed in the industry increasing? If so how far would your answer change if the question were asked in five years time?

b) What major changes have occurred in production processes in the last ten years?

c) Can you give an example of the sort of investments needed to put in modern equipment or processes, and the sort of cost or productivity gains which result.

d) How extensively has it been possible to employ more modern equipment or processes, and what are the main constraints on doing this?

e) In particular, what sort of production runs are needed to justify more modern processes (eg the installation of dedicated assembly equipment)? Does this mean that minimum economic production runs can be expected to change in the future, and have they changed since 1970?

f) Has technical innovation forced you to increase the numbers of related "overhead" staff such as R&D or engineering support in order to keep with the technical race, and if so to what extent?

7.a) Do you see a reduction in the future of the number of companies surviving in the vehicle silencer business (eg as a result of customer sourcing policies or because of the level of operations necessary to remain competitive)?

b) What competitive strengths do you feel will hold the key to companies surviving in this business area?

c) Who do you consider your key competitors, both nationally and if appropriate overseas? Is there a shift taking place possibly with overseas competitors becoming more important than in the past?

d) How do these key competitors compare with yourselves on the key competitive strengths identified in b)?

e) Of key competitors including yourselves who do you see as having been "moving up the pack" and who "moving down the pack", perhaps becoming more vulnerable in the future?

D. Past policies for offsetting decline in domestic vehicle markets

8. What roughly is the value of your vehicle exhaust systems turnover, first as regards cars and second commercial vehicles, and what is the rough split between OE and AM? What, again roughly, would these have been in 1979 and in 1972 or alternatively as far back as possible?

9.a) Between 1972 and 1981 UK car production fell from about 1.9m units to just under 1m units, with commercial vehicle production having also fallen very substantially. Roughly by what proportions have car and commercial vehicle silencer markets fallen first on the OE side and second on the AM side.

b) What is the rough selling price of a typical exhaust system (complete system) and in the car and vehicle markets, first with respect to the OE side and second the AM?

c) How have prices moved over the last ten years and since 1979? eg How far have they kept up with inflation or have they been squeezed by intensifying competition? If the latter do you see the situation as likely to improve, stabilise or further intensify in the future? In particular how far is the situation affected by overseas competitors, especially in view of reports that vehicle assemblers expect to increase substantially their proportion of overseas parts?

10.a) What has been the effect of the UK decline on your numbers employed in the manufacture of vehicle exhaust systems? If possible please give rough figures of numbers employed on this now, about 1979 and some time further back, preferably about 1972.

b) Could you please give a similar indication of the effect on your own volume of business.

c) Would this be a reasonably accurate reflection of what has been happening to productivity? How far do you expect your level of productivity to alter in the future, firstly if markets improve, secondly if they remain at the present level and thirdly if there is further decline?

d) What has been the effect on your cost levels? How for example does the gain through increased productivity and other efficiency improvements compare with the more detrimental effect of a declining market base?

e) What has been the effect of the UK decline on profitability since 1972/3, eg on margins or return on capital employed?

f) What has been the effect on investment in plant and equipment etc?

g) What has been the effect on intangible investments such as R&D, training, design, sales effort or other subtle ways whereby firms can improve their future competitiveness, eg taking lower or even negative profits in order to build share in more attractive markets?

11.a) What was your company's original strategy for dealing with the decline in the UK market (eg expanding overseas, diversification, contracting into best profit areas)?

b) How far have such strategies been successful in offsetting the UK decline?

c) What problems have you encountered in attempting to implement these strategies?

d) In particular, what problems have you encountered in attempting to increase the proportion of overseas sales? Is international trade restricted to only certain parts of the business in practice?

e) In Western Europe do you find a significant proportion of the business is firmly in the hands of domestic

producers, perhaps by virtue of their proximity or through close ties with customers? Have you had experience of this being the case with any particular customers?

E. Future developments affecting automotive business

12.a) With automotive customers increasingly set up on an international basis, the advent of the world car and possibly world truck and with an increasing number of international agreements on joint operations, eg on the sourcing of major upstream components such as engines, the industry appears to be becoming more internationalised. What has been the effect on your own business and what do you think will be the effect on your future activities?

b) What roughly do you feel will be the effect on the volume of the vehicle exhaust system AM of any trend towards longer life exhaust systems in five years time?

F. The role of government

13. In the last ten years do you consider that UK exhaust system manufacturers have received as effective support from government as have their competitors in Germany, France, Italy, Japan, Spain or the USA? In what ways could the government have better supported the vehicle exhaust system business with hindsight, particularly with respect to the following areas?

a) supporting the UK vehicle industry (eg through funds to B.L.);

b) supporting component suppliers through "local content" agreements;

c) supporting UK industries in the context of international competition through action to bring about a more competitive exchange rate or possibly even limited import controls?

d) investment incentives to assist component companies in becoming more competitive?

e) supporting component companies through schemes to help coordinate their activities to deal with common problems (eg as happened in the castings industry) perhaps to reduce widespread overcapacity?

14. What are your views on the government's policies as regards franchising arrangements and how much effect do you think they will have in practice?

15. If vehicle assembler's patents are deemed to extend to basic engineering parts, enabling them to request royalty payments from component companies where this is the case, how much effect will this have on your company's activities?

16. Are there any other issues relating to government policies which you would wish to raise, and which of the issues discussed do you feel are most important to the success of your own business?

17. Do you expect import penetration to rise appreciably in the next five years and do you expect any government action, either at the national or at the EEC level, to

give any measure of protection, eg against imports from low cost areas of the world (with respect to vehicle exhaust systems)?

18. A number of factors affect the competitiveness of companies operating in the UK and affect how attractive the UK is in general (eg as compared with, say, operating in Spain) but which of the following do you feel are most critical to success in your own business area:

a) industrial costs eg labour, purchases and services such as energy, rates etc.;

b) markets,eg size, growth and stability;

c) finance, eg profitability, risk, cost and availability of finance;

d) infrastructure and convenience with respect to wider international markets;

e) the labour force, eg industrial relations, working practices and attitudes with respect to innovation;

f) UK organisational performance in general.

Appendix A.2

Interviews with Japanese Automotive Parts Manufacturers

A. Questions relating to the formulation of strategy.

1. What do you regard as your key company objectives?

   a) return on capital employed (in terms of profit)

   b) growth of sales

   c) growth of market share

   d) technical leadership

   e) reputation for product quality

   f) good company name

   g) stable dividend policy

   h) other

2. What time horizon do you use when planning for capital investments? eg What pay-back period or other criterion do you employ?

3. How involved are financial institutions in funding your operation with respect to your long range plans?

4. Do you have a formal system of planning ahead, eg a five year planning schedule?

   Do you use any formal planning techniques such as the analysis of "product portfolios", as put forward by the Boston Consulting Group, for example?

5. Who is involved and what type of meetings do you have?

6. What developments do your plans cover and what are the main types of information involved?

7. How does your planning relate to those involved with implementing them?

8. How stable is the business planning environment in Japan, eg with respect to customer ordering schedules?

B. Questions on Japanese managers and engineers.

1. Could you briefly outline typical career paths for:-

a) a foreman (is there more than one route to this position?)

b) a senior foreman or superintendent

c) a department production manager

d) Chief Executive Officer and other board members

e) an engineer working in design

f) an accountant

g) a graduate entering the company

2. In particular, what training / qualifications are involved?

3. What are typical annual salaries of the following staff?

a) an unskilled operator on entering the company

b) an average unskilled operator

c) a skilled man on entering the company

d) an average skilled man

e) a foreman

f) a departmental production manager

h) a graduate engineer on entering the company

i) a graduate engineer aged 30 engaged in design work

j) a typical accountant aged 30

C. Questions on productivity with respect to the manufacture of automotive ball and roller bearings*

1. What were your total sales of bearings in 1982?
2. What was the total number of bearings produced?
3. Approximately, what % of sales value was the cost of materials and parts procured from outside your factories?
4. How many employees did you have on bearings manufacture?
5. Approximately, what was the total remuneration of these employees, including on-costs?
6. Could you give any analsis of appoximately how many of these employees there were in the main categories, for example: direct/indirect, quality control or inspection, maintenance, full time supervisory production management, sales or marketing, and engineers in design, in research and development, and in production related departments.
7. What number of different types of bearings do you supply and what are your main lines?
8. What "lot sizes" (ie the number of bearings produced before it is necessary to change over tooling) are typical for your main product lines?

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* subsequently referred to as "bearings"

9. At what exact stage do your company's activities start, ie which operations are effectively sub-contracted, eg with respect to initial machining, tool manufacture, use of sub-contract labour on your own premises etc?

10. At what stage do your company's activities finish, ie do they include operations such as warehousing and distribution?

D. Questions on causes of international productivity differentials.

1. In achieving high productivity how important have been the advantages of volume production,

a) through enabling larger "lot sizes"?

b) through facilitating the introduction of technological innovation?

2. Approximately, what is the value of total "capital employed" in bearings activities (ie total assets less current liabilities)?

3. Could you give any rough indication of typical figures for yearly investment/sales or R&D expenditure/sales ratios?

4. Could you give any illustrations of the numbers of direct operators per machine or per assembly line?

5. Could you give any examples how long it takes to change over particular machines, or assembly lines, from one job to another?

6. Typically how often does this occur, and how far have you been able to improve changeover times in recent years?

7. Roughly how many days stocks do you hold with respect to raw materials, "work in progress", and finished stock? How far have you been able to improve this situation in recent years?

8. In real terms, how much have sales and also productivity grown in recent years?

9. What aspects of manufacturing policy have been most important in improving productivity, eg productivity groups, quality circles, engineering applied to existing equipment, improved work layouts, new equipment or processes etc?

10. Does not increasing productivity lead to unemployment of at least some part of your labour force, particularly as sales growth begins to fall? What has happened to the productivity of indirect workers in recent years? If this is not a problem, what is your solution?

E. Questions with respect to business developments affecting manufacturers of automotive bearings.

1. During the next 5 to 10 years, do you expect to see an increase in your export/sales ratio, in international tie-ups or joint ventures or in overseas production?

2. Would you expect other bearing manufacturers (eg Koyo Seiko) to do so?

3. The introduction of integrated assembly lines in the late 1960's and early 1970's considerably altered the pattern of competition among bearing manufacturers, forcing rationalisation. What further developments might have a similar impact on the pattern of competition?

4. What will be their effect on the future pattern of competition, eg would you expect such changes to lead to further concentration within the industry or further rationalisation?

5. If so, which companies worldwide, apart from your own, do you see as in a strong position in such a situation and which do you see as weaker and perhaps more likely to lose market share?

6. In particular, what is your view of UK manufacturers?

7. What changes now taking place in the automotive industries do you see as having most impact on the business of manufacturing automotive bearings?

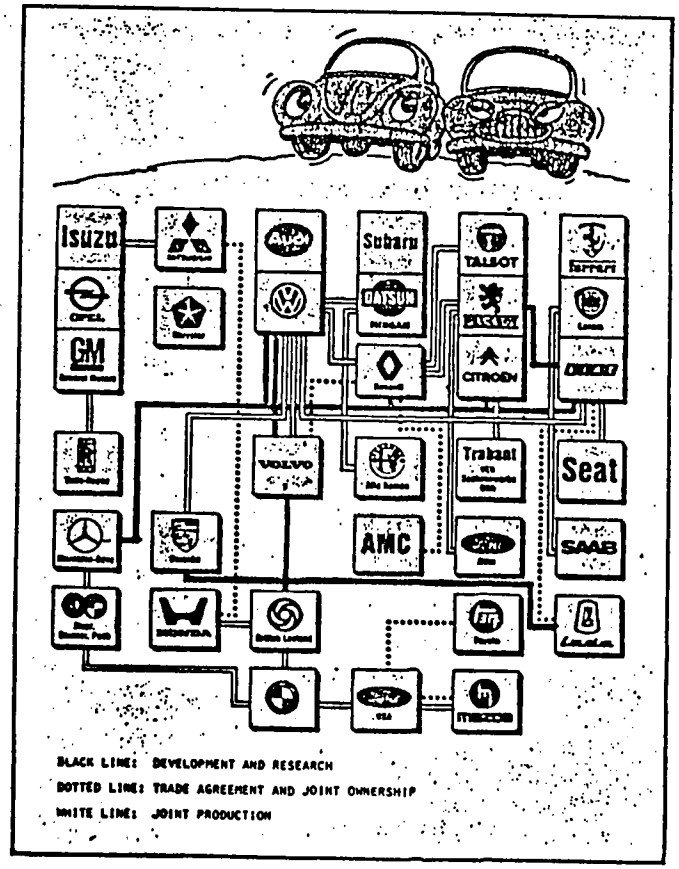
8. What do you see as the main possible effects, eg would you expect changes in assembler/supplier relationships, or suppliers to have to structure their operations differently in order to service changing customer needs?

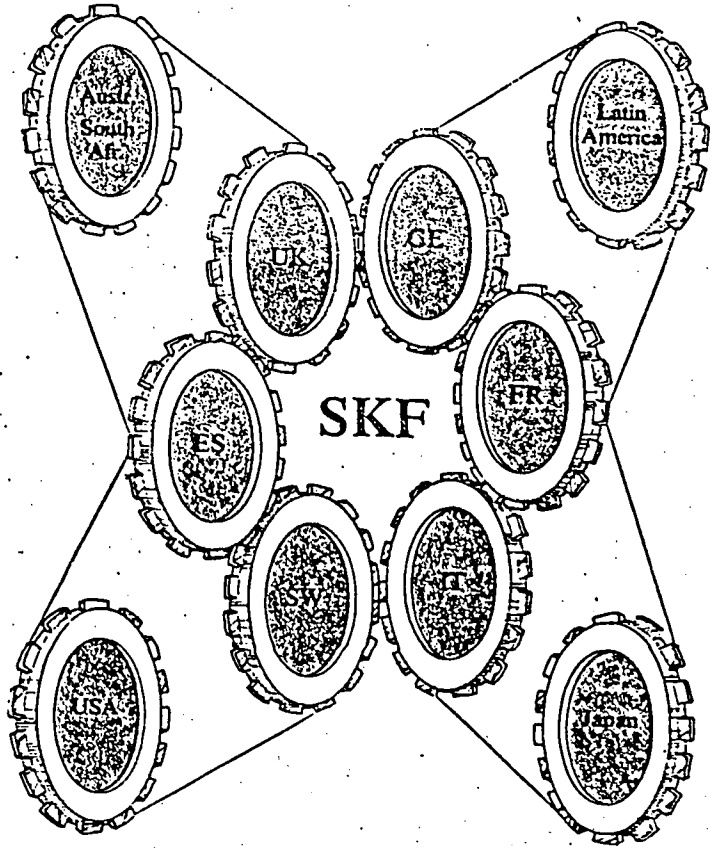
9. What impact do you expect more flexible manufacturing systems to have on the manufacture of automotive bearings in the next 10 years, eg with respect to assembly methods?

Appendix B.1

Changes in SKF's Organisational Structure in Response to Internationalisation in the Vehicle Industry

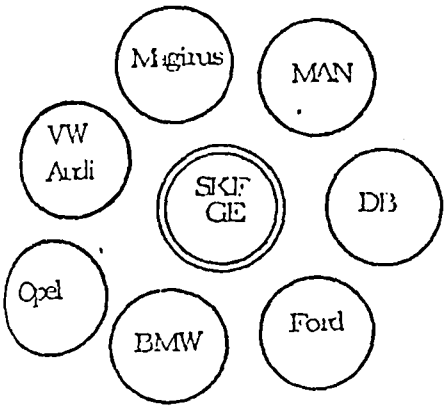
Growing Internationalism
World components and cars

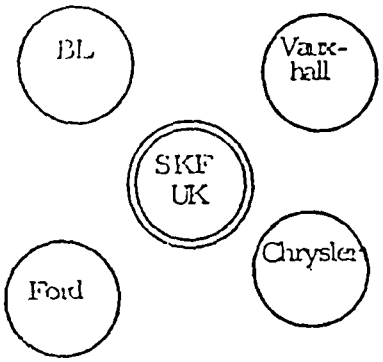


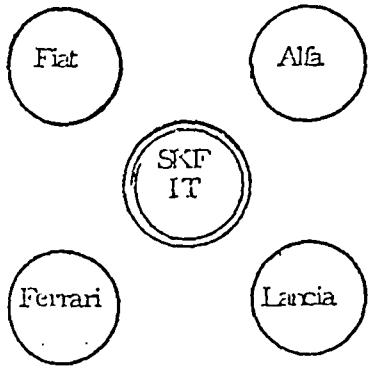


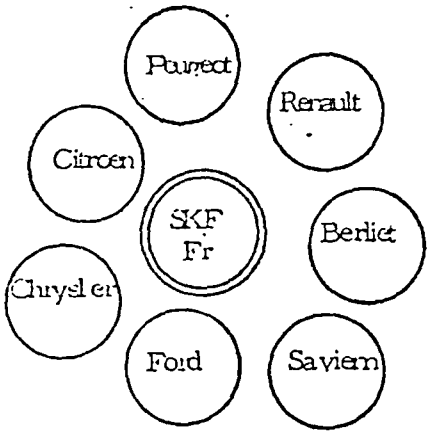
Increasing need for information, flexibility and coordination

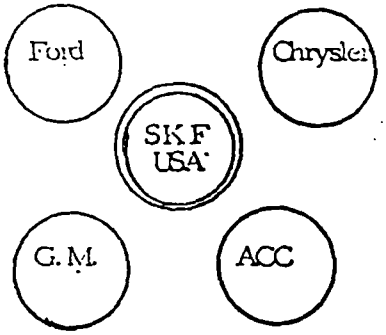
SITUATION 1974



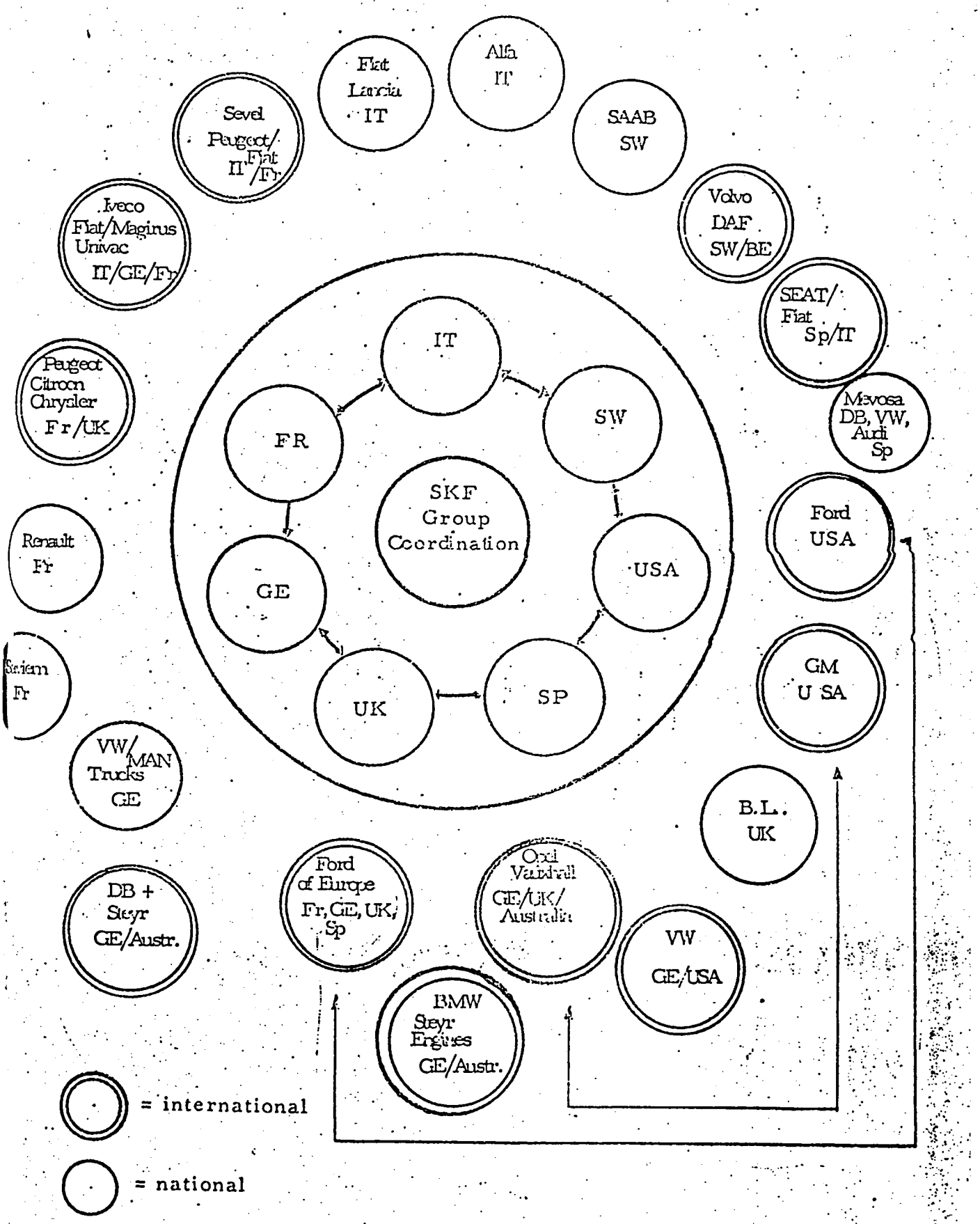




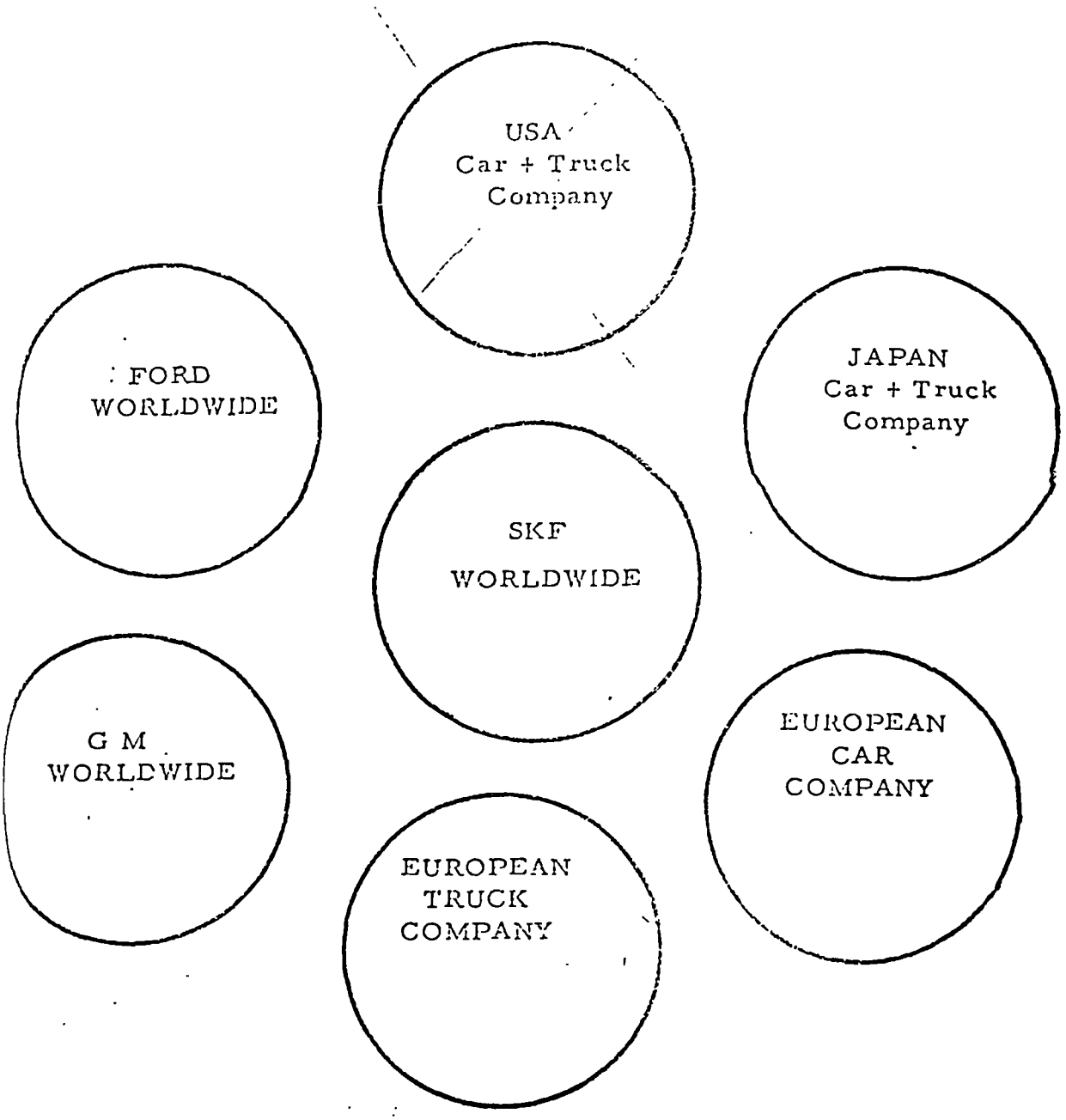




SITUATION 1978



SITUATION YEAR X

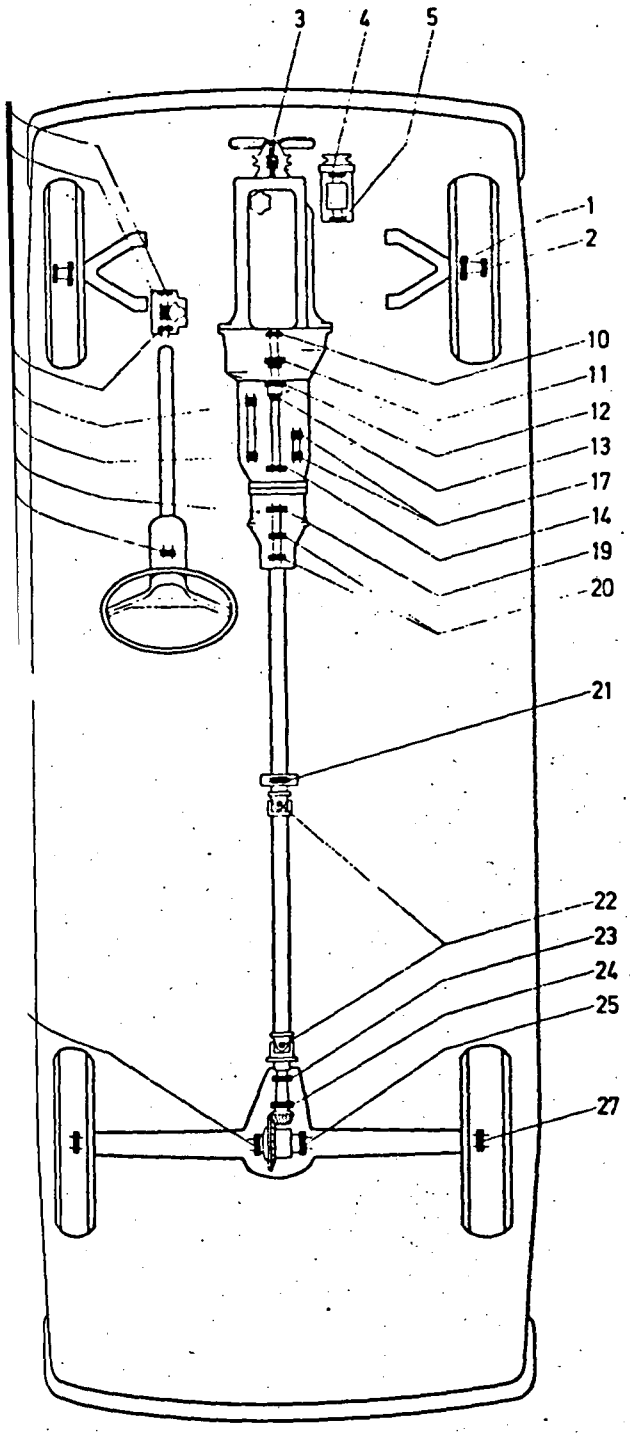


Appendix B.2

Main Bearing Positions in Cars and Trucks

Main bearing positions—layout

entional cars

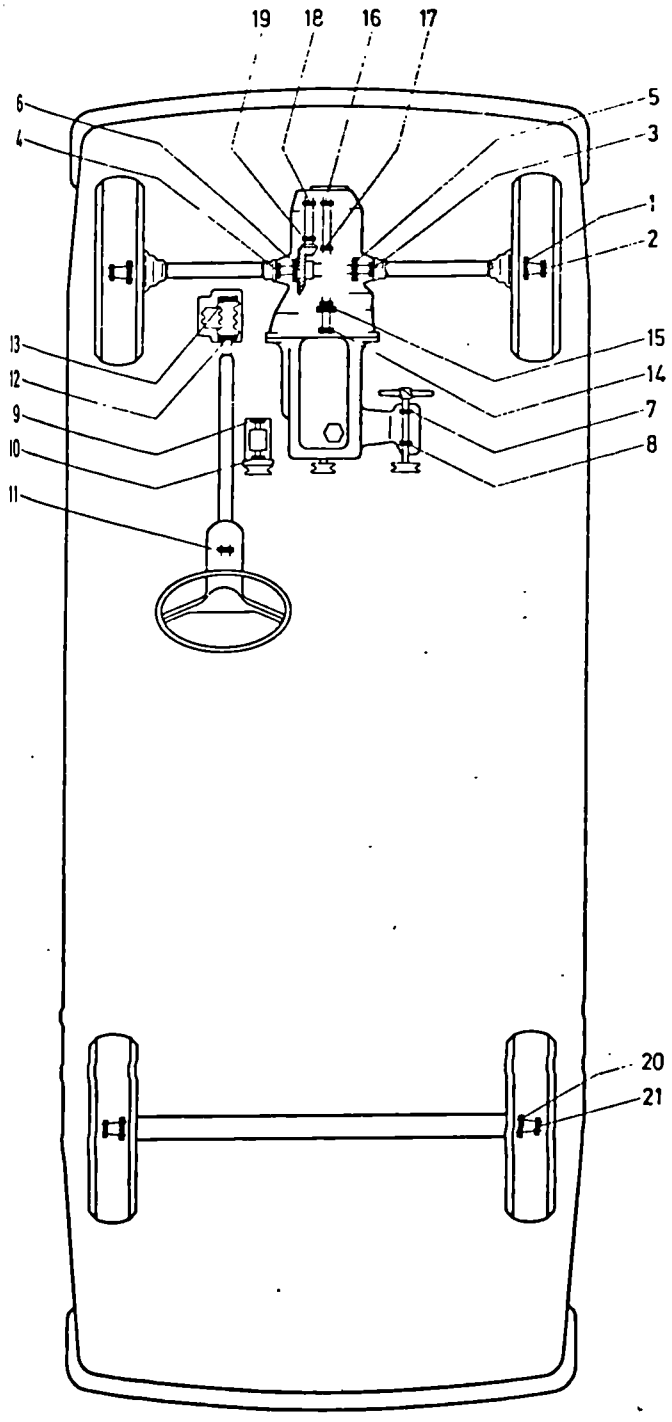


1 Front wheel, inner
2 Front wheel, outer
3 Water pump
4 Dynamo or Alternator, front
5 Dynamo or Alternator, rear
6 Steering column
7 Steering worm, upper
8 Steering worm, lower
9 Steering nut
10 Clutch spigot
11 Clutch withdrawal
12 Constant mesh pinion
13 Main shaft, front
14 Main shaft, rear
15 Lay shaft, front
16 Lay shaft, rear
17 Reverse idler

18 Overdrive:
19 Free wheel
20 Output shaft

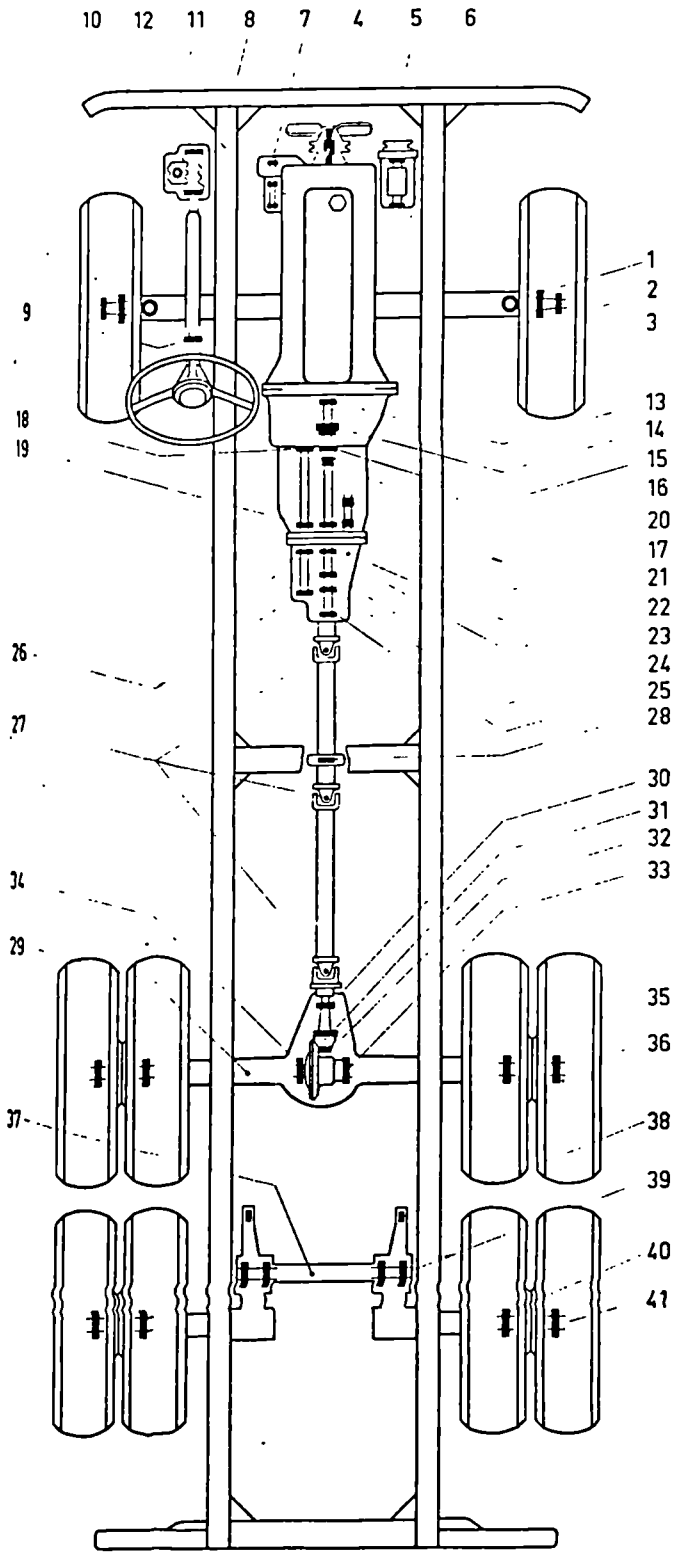
21 Propeller shaft, support
22 Universal joints
23 Bevel pinion, front
24 Bevel pinion, rear
25 Differential, right
26 Differential, left
27 Rear wheel

Front wheel drive cars with engine behind transmission



1 Front wheel, inner
2 Front wheel, outer
3 Half shaft, right
4 Half shaft, left
5 Differential, right
6 Differential, left
7 Fan and Water pump, front
8 Fan and Water pump, rear
9 Dynamo or Alternator, front
10 Dynamo or Alternator, rear
11 Steering column
12 Steering worm, upper
13 Steering worm, lower
14 Clutch spigot
15 Clutch withdrawal
16 Drive shaft, front
17 Drive shaft, rear
18 Main shaft or Pinion, front
19 Main shaft or Pinion, rear
20 Rear wheel, inner
21 Rear wheel, outer

Conventional trucks (6×2)



1 Front wheel, inner
2 Front wheel, outer
3 Swivel pin
4 Water pump
5 Dynamo or Alternator, front
6 Dynamo or Alternator rear
7 Injection pump drive
8 Injection pump
9 Steering column
10 Steering worm upper
11 Steering worm, lower
12 Steering lever arm
13 Clutch spigot
14 Clutch withdrawal
15 Constant mesh pinion
16 Main shaft, front
17 Main shaft, rear
18 Lay shaft, front
19 Lay shaft, rear
20 Reverse idler

21 **Auxiliary transmission:**
22 Drive shaft, front
23 Drive shaft, rear
24 Main shaft, front
25 Main shaft, rear
26 Lay shaft

27 Universal joints
28 Propeller shaft, support

29 **Rear axle:**
30 Bevel pinion, front
31 Bevel pinion, rear
32 Bevel pinion, pilot
33 Differential, right
34 Differential, left
35 Rear wheel, inner
36 Rear wheel, outer

37 **Trailing axle:**
38 Spring shackle
39 Balance arm
40 Wheel, inner
41 Wheel, outer

Appendix B.3

The Competitive Situation of Other Multinational Companies' Bearings Manufacturing Operations in the UK

B.31 Torrington

B.311 Reorganisation in the face of international competition

International reorganisation has been a major strategic theme at Torrington and has had profound effects on their UK operation. This almost led to the complete closure of UK manufacturing operations, and employment at their main Coventry plant was reduced from 700-800 a few years ago to only about 300 now.

Even so, Torrington feel they may have reacted too slowly to what is now considered a highly international pattern of competition. During the 1950's and 1960's their manufacturing operations in Britain, Germany and the USA were organised on a regional basis. Markets were divided up "to avoid people stepping on each other's toes": both the UK and Germany operated as separate profit centres and with separate chief executives. Apart from receiving financial data and decisions on investment funding, the parent company was little involved in the running of the UK operation. There was little even in the way of equipment and tooling exchanges.

However, in the automotive area things began to change towards the end of the 1960's and strains were beginning to be manifest in this organisational approach. The parent company was slow in responding to the need for metrification in the German market and lost valuable ground to European

competitors before being forced to react.

By the mid-1960's working contacts were taking place between the operations in the UK, Germany and the USA, with research reports comparing productivity on specific items of equipment for example. The Torrington International Sales and Production Office (TISPO) was set up to provide coordination within Europe.

In the early 1970's Ford, General Motors and Chrysler began extending their international operations and Torrington found it necessary to follow in support, setting up plants in Brazil and Australia. With Australia's high local content requirement, their Australian plant not only secured their Vauxhall business but gave them the lion's share of the remaining market at the expense of INA, their major competitor.

In the mid-1970's a US General Manager was sent to Europe to bring European operations closer together. A computerised information centre was set up in Dusseldorf to provide coordination. (Such moves tended to mirror those by automotive customers: Ford in 1969 sacked a number of UK staff involved and brought in sophisticated US information and control systems). The imposition of US systems proved to have its limitations but this concept survived until 1981.

In 1980, a major change took place in the attitude of the parent company to the need to coordinate international operations. This arose partly from top level changes brought about by Ingersoll Rand which had taken over in about 1973. Recession and intensifying competition created the pressure for international rationalisation and a new

General Manager was sent to Europe to carry this out and to cut European losses.

US and European product designs and tooling were further standardised. <>

In the meantime, the Dusseldorf office was closed down with some of the functions transferred to UK and German plants and a major campaign was mounted to cut overheads in Europe. European coordination was replaced by everything becoming linked on an international basis extending to the US, for example: computer systems, sales enqiries, warehousing and distribution. Modern communications have been introduced with telefax playing a key role. Just as with SKF, English has been made the common language for business communications throughout the group, even in Brazil.

Such integration of international operations has improved their service to vehicle producers. For example, they have recently carried out a quotation for a set of transmission bearings for General Motors Philippines. Five years ago, the part of Torrington receiving the enquiry would pick off the items they were interested in, tick them off on a list which would then be passed around the group, with other operations ticking off what interested them on an individual basis. This tended to result in overlapping quotations. Now, whichever part of the group is approached they can pull all the operations together, making rational decisions and taking into account where similar items are being made in the group. A comprehensive quote is then submitted to the customer. Response time from enquiry to

quotation has also been improved.

Commonality of equipment, particularly tooling, is critical to this approach. For example, with the high dollar in 1982 they found the US parent plant could not compete on price in the German market, and consequently tooling has been transferred to Europe. This is also useful in supporting vehicle companies affected by sudden changes in local content requirements (eg Brazil) since the necessary tooling can be moved quickly to the required plant location.

Finally in March 1983 the announcement was made of even more extensive reorganisation internationally. One new division, Torrington International, will deal with all operations outside North America. It will handle sales and production aspects as well as finance.

B.312 Effect of internationalisation on management philosophy at operations level

To match international standards of competitiveness, the group has increased its emphasis on manufacturing policy. They had noticed how the production function had become down-graded compared with other staff functions in their UK operation, so much so that few production people appeared to progress to senior positions by comparison with the USA.

There were two priorities if the UK operation was to survive. These involved both management and employees displaying greater commitment to keeping up with standards achieved elsewhere in the world.

First, productivity had to be brought into line internationally. The UK was particularly weak in terms of

overhead personnel such as people following jobs round from department to department, many in peripheral menial jobs transporting work around on almost a "bucket by bucket" basis, and by US standards low productivity on clerical tasks. Internationalisation, by allowing longer production runs, provided opportunities for improvement. It allowed the Coventry plant to justify their first belt furnace in December 1982, making a significant contribution to productivity.

Second, they had to move to more flexible and responsive manufacturing systems, as lead times were forced down by competition. A major campaign has been necessary to reduce factory through time (the target is "four (weeks) on the floor" compared with a present figure of about 3 months) and also changeover times. This requires redesigning and re-engineering tooling systems, with attention to the problem of attaining accurate adjustments rapidly. New "black box systems" have been installed in the UK. Such developments have allowed them to bring down unit costs of a 100,000 per month order to those of a former 500,000 per month order. To appreciate the commercial significance of such developments requires some idea of scale economies. <>

It is clear that this increased flexibility is becoming an important demand from vehicle companies, particularly Ford. Ford is now fully aware of substantial developments made in this direction by Japanese suppliers, and internationalisation means Western suppliers have got to keep up with manufacturing developments which have been going on in Japan.

Effective implementation of such change has forced them to deal with wider issues. It has not just been a question of isolated technical changes: the extent of the changes required has been such as to demand the active contribution of large numbers of personnel in the production area. This in turn has demanded two things: first a change in the industrial relations atmosphere; and second they have had to review their skills in production, particularly with respect to supervisory management.

B.32 INA

B.321 INA's UK operation

INA's UK manufacturing operation was set up to support the parent company's business with Ford UK in about 1959. It is very much a "cats and dogs" plant aimed at giving the UK marketing operation some local support, and at doing short production runs which would be a nuisance to INA's main factories. The value of UK manufactured products represents more than a third of nominal INA UK sales but the marketing operation is relatively very important. In the UK it employs about 300 people.

The manufacturing side in the UK is said by INA to be running at a loss but like SKF's operation there is some cushioning through its position within the group. Thus as the UK real exchange rate rose in 1980, undermining the international cost position of UK manufacturing operations, this nevertheless increased the profitability of their UK marketing operations. Although in theory manufacturing has to "stand on its own feet", there seems to be some

cushioning so long as the UK operation as a whole remains profitable, which has been the case.

Unlike SKF UK, INA's UK plant has to finance its own investment from profits. For example, in 1981 they went ahead with a CNC machine costing about £90,000. <>

The immediate problem underlying manufacturing losses is the decline in business volume in the UK <>. In their case, market decline has been even more severe in non-automotive applications. The textile machinery industry, which accounted for about 14% of their business in 1969 has since moved to countries with lower labour costs. Dependence on the automotive industry is high at over 40% <>.

Their profitability has been affected less by the rise in the real exchange rate, than by market contraction, partly influenced by demand policy. Falling markets sharply increased domestic competition as suppliers "fought over the size of the remaining bone". As the bargaining position of remaining customers strengthened, suppliers' profits were reduced substantially.

At the same time they have been forced to provide more precisely the type of service which customers ideally prefer, even at some considerable cost. Customers are for example pushing back onto suppliers the cost of stock holding, recognising the advantages that Japanese vehicle companies have in relation to this cost area. They have also had to build warehousing facilities at Sutton Coldfield in addition to the plant at Llanelli to improve their delivery service. They are having to provide a merchandising service, rather in the same way that Sainsburys require such services

from their suppliers. Customer order schedules are being severely chopped about. As a result they find themselves caught out carrying the cost of high stock levels, in the context of high "real" interest rates brought about by tight government credit policy.

The decline of the attractiveness of UK manufacturing was demonstrated in Febuary 1982 with a further cut in UK employment of about 40%.

B.322 Needle bearings

The company's core product area was originally needle bearings. Competition has intensified in this area on a worldwide basis. On the one hand SKF is trying to move in, having allowed INA to get their foot in during the last war; on the other hand there is competition from lower cost parts of the world <>. INA are now very much structured on a worldwide basis, with manufacturing plants in the UK at Llanelli, Germany, France, Italy, Spain and Brazil as well as license arrangements with NTN of Japan.

Apart from the major world bearing manufacturers such as SKF, their nearest rival and perhaps their key competitor in needle bearings is Torrington, which is similarly set up. Keen competition between them has to some extent stalemated with INA ahead in Europe on market share and Torrington ahead in the USA. <> There is also some division beween the two on standards, with INA heavily in metric bearings which are used in mainland Europe and Torrington with its US base carrying more imperial sized lines.

There is also a smaller French company, Nadella,

specialising in needle bearings; however, it does not appear to be strong enough to deal with the challenge of internationalising competition and its position is reported to be declining if not indeed collapsing. In fact, Nadella is now up for sale <>: an interesting example of the shake-out which appears to be happening on an international basis in this industry.

As competition has intensified in conditions of worldwide over-capacity, so both INA and Torrington have established coordination groups over their worldwide operations to deal with the international requirements of automotive customers, making use of modern communications technology and sophisticated control systems. Like SKF, INA point to the fact that their major automotive customer likes suppliers to be able to switch production internationally to suit location changes by themselves, and they see this as giving multinational company suppliers an important competitive advantage. The other factor they see as important in this respect is having the back up of production capacity in order to meet larger order requirements, something which is becoming an increasing strain on the facilities of smaller nationally based companies.

INA UK's needle bearing operations are now peripheral to those of the main company. <>

Another factor affecting the volume of needle bearings business in the UK has been the move by vehicle customers to joint ventures. The UK market is affected particularly by BL going overseas for gearboxes which is a major area using needle bearings. The parent group is in a position to offset

this local loss of business with some gains elsewhere in the world by virtue of its international structure, but this does affect INA's UK manufacturing plant.

B.323 Specialist applications

The parent company has however been consistently moving over to more specialist engineering applications, using bearings merely as part of complete assemblies. This represents a positive and quite conscious strategy of moving up value added, based on the company's strength in technological applications involving bearings. This is in recognition of the fact that the standard catalogue bearings business is being squeezed by the large groups at the top end of the business, and by lower cost countries such as Poland (F.L.T.) and Singapore (where SKF have recently set up) coming in on the more basic technology.

About 15 years ago they developed an engine fan belt tensioner bearing assembly, followed five years later by hydraulic tappets, another specialist product. About nine years ago they were the first to produce a self-aligning clutch release bearing assembly. Modern developments are more confidential, though steering joint applications appear one likely area.

B.324 Clutch release bearings

The UK plant manufactures clutch release bearings. The company sells four variants to the UK market, but only one type is presently made in the UK. Given the reasonable business volume in this area, the company has begun to

rationalise manufacture on an international basis, so that the variants produced in the UK are also sold to the German market. Previously, exports were not significant for UK manufacturing operations, but for this product exports now represent about 60%.

Further rationalisation is likely. The customer's purchasing department for this particular product tends to prefer local production, but there are signs that the customer is relaxing such conditions in other areas. <>

As international competition intensifies, the technological back-up available to large multinational companies is becoming increasingly important. SKF is reported in the industry to be coming out with a "string of patents" aimed at restoring the lead which INA's development of the self aligning clutch release bearing took away some years ago. This battle between INA and SKF is likely to intensify competition, putting considerable pressure on RHP.

B.325 Tensioner bearing assemblies

Tensioner bearing assemblies are essentially pressings incorporating double row ball bearings. <>

Technology is important in competition. INA's dominant position resulted from introducing a new pressed product which replaced a more expensive cast product. SKF and Torrington are the other important competitors in this area. RHP seems to lack the technological and international support to keep up.

The company is acutely aware of comparisons with its German operations, <>. As a result, its productivity in the UK plant is now about 40% higher than in 1972, though it is

still well behind Germany.

B.33 NSK

B.331 NSK's UK manufacturing operation

NSK's manufacturing operations in the UK started up in early 1976, based on five bearing lines focused onto the most popular metric sized ranges in the electrical bearings segment. By 1978 they had moved up from single shift working to full three shift working and in spring 1981 they introduced four further bearing lines, taking production capacity up from 21m bearings p.a. to 24m. Further new lines are planned for operation in about mid-1984. <> Thus UK production is expanding and would seem set to continue to do so.

Employment has also has increased from 133 in 1977 to 230 people in 1982, excluding a further 45 at head office mainly in marketing and administration. They are involved in some further recruitment and training at the present time.

It would however be dangerous to interpret this as at last a bright spot indicating that at least one situation of bearings manufacture in the UK is competitive. The work being carried out in the UK represents a proportion of business won by the parent company in Japan and so represents a transfer of production. NSK felt it necessary to set up production in Europe to counter political problems threatening to undermine its international position: eg the European Court of Justice's anti-dumping actions and Italy's refusal to take Japanese bearings unless sourced within the EEC. Approximately 80% of the UK plant's output is for

export, mainly to mainland Europe (though such exports still constitute only about 30% of NSK sales to Europe).

Up to 1979, UK accounts showed they were still making losses, although this includes marketing operations. Since then it is likely that the financial position on UK manufacturing has deteriorated and the company feels the UK has become a harsh environment from which to do business. They have been affected to some extent by the UK downturn and output is down compared with a capacity <>. Modern volume orientated plants, such as their own, are the ones hardest hit by market contraction. Whilst partly sheltered by their high export ratio, they have been particularly vulnerable to the rise in the real sterling exchange rate. They are perhaps cushioned by the parent group since the sales subsidiary in mainland Europe has been instructed to accept price levels on a sterling basis.

The underlying financial situation of the UK manufacturing operation seems to have deteriorated further since 1979. The view at NSK UK seems to be that support for expansion in such circumstances reflects a difference in the Japanese approach to business: it is unlikely they would have received such support on commercial criteria typical in Europe or the USA.

The parent company is aided by funding support from its link with the Fuji Bank and considerable emphasis is placed on the longer term market position. Each new investment is judged in terms of the role it plays with respect to market share targets, technical position etc. There are no simple rules but if the "position is right" they are even prepared

to consider projects with pay back periods occasionally as long as 20 years.

Japanese objectives place great store on increasing output levels, which of course becomes more important in the context of the parent company's lifetime employment policies. To have to reduce output levels would be considered as a "slap in the face". Disruptions to manufacturing operations are frowned on and they are prepared to ride situations which would be considered non-commercial by Western standards. The reason they can do this is that this commitment to competitiveness, particularly with respect to technology and manufacturing operations, underlies their high market share position which in turn generates the necessary cash flow and ultimately profitability.

Despite difficult economic conditions, NSK's experience of manufacturing in the UK seems to have gone quite well from their viewpoint. They are particularly concerned about labour relations and their experience here has been good. The policy has been to recruit extremely young workers whose attitudes are thought to have had less chance to harden. Their management philosophy in dealing with employees is also radically different from Western approaches.

Productivity is said by their UK managing director to be as good if not better than Japanese plants. The parent company points out though that overseas plants are highly focused onto mass production lines whereas Japanese plants handle an enormous variety of bearings, and the UK plant is extremely modern. However, the parent company do not appear to feel they have any productivity problem operating from

the UK.

B.332 The parent company's strategy

NSK's emphasis in Europe has been on the electrical bearings segment, so only a small proportion is automotive. These applications are principally on alternators and starter motors, and also on windscreen wiper motors. The segment is interesting as it exemplifies globalisation of competition already taking place in volume segments.

In a global perspective, NSK's strategy is coherent. From a strong base as the market leader in Japan, NSK launched its attack on world markets about 20 years ago, (with a clear target <> stated in terms of world market share). Its resources were focused onto just a few very high volume metric sized radial ball bearings for electrical markets. It had recognised that the change from batch to continuous line production methods created a market opportunity, justifying a more global pattern of competition. They were assisted by volume benefits,w hich were particularly high in this sector. Transport costs were low and this market was accessible through Europe's well developed and "open" distribution network. Having slightly expanded their product line, they now dominate the European electrical bearing market. Many European companies, including RHP, have been squeezed out altogether.

Its initial approaches to UK customers were "laughed off" by UK manufacturers, in view of very evident shortcomings on quality. As UK manufacturers remained complacent, NSK took recourse to expensive processes such as

extensive honing operations to meet quality requirements, whilst still (to quote one European competitor) "slaughtering the price". Even so penetration took several years, and some willingness to sustain initial losses. The Japanese funding advantage was important at this stage. The same rather envious competitor commented, "Our shareholders could never afford the luxury of following that line". NSK, however, aggressively exploited experience effects, forcing costs down, and as was shown in Table 25 they have been fairly profitable.

Trade restrictions have forced them to support their market position with overseas manufacturing operations. EEC anti-dumping actions prompted their establishment of the UK factory. They cite the 80% local content requirement in the Australian market and they are particularly concerned by the possibility of similar moves by US Congress. They have now established a US manufacturing facility, in addition to their Brazilian plant.

NSK expect to exploit new methods of production in the future, both by further development of dedicated production lines (aimed at volume segments) and through increasing the flexibility of manufacturing systems, which would enable them to attack lower volume business. Like other large bearing companies, NSK see such developments as "raising the stakes" for participants. Larger producers in this capital intensive business are hungry for volume, and smaller or weaker companies may be squeezed out as greater international concentration takes place. <>

The question, from an automotive viewpoint, is whether NSK, in expanding out of its present electrical segment,

will be forced to turn its attention to major automotive bearing markets, these representing the next most volume orientated bearing markets.

<>

The new production lines at their UK plant are not however orientated to OE automotive markets. NSK's only automotive impact in the short term will be in terms of further involvement in the indirect market, bearings supplied to other automotive components such as starter motors.

B.34 Fafnir

The parent group has been affected by internationalisation. Hit hard by more powerful international competitors such as SKF and the Japanese, it has been forced to retreat from the volume bearing markets, particularly the electrical bearings segment, and to retrench onto two specialist areas in which it still has a tenable strategic position in world terms: aerospace applications and specialist machine tool high precision bearings.

The decline of its UK manufacturing subsidiary reflects this change. In 1979 the company was finally forced to acknowledge defeat in the standard bearings segment, with the closure of its Wolverhampton plant which involved 650 redundancies. This leaves the company with only one UK plant at Wednesford, mainly on the specialised bearings referred to above.

This company is not considered in great detail since

electrical bearings are only a minor automotive application, and Fafnir's other applications are even less automotive related. It will be noted however that this somewhat marginal case (from the viewpoint of automotive applications) does bear out two major themes in this section, illustrating the effect of the internationalisation of competition and of the decline of the UK competitive position in this context.

Appendix C.1

Main Forging Positions in Cars and Trucks

NOMENCLATURE : TERMS USED

The two following diagrams show, for passenger cars and commercial vehicles, the components mentioned in the report in their positions in the vehicle. They are listed below according to the number on the diagram.

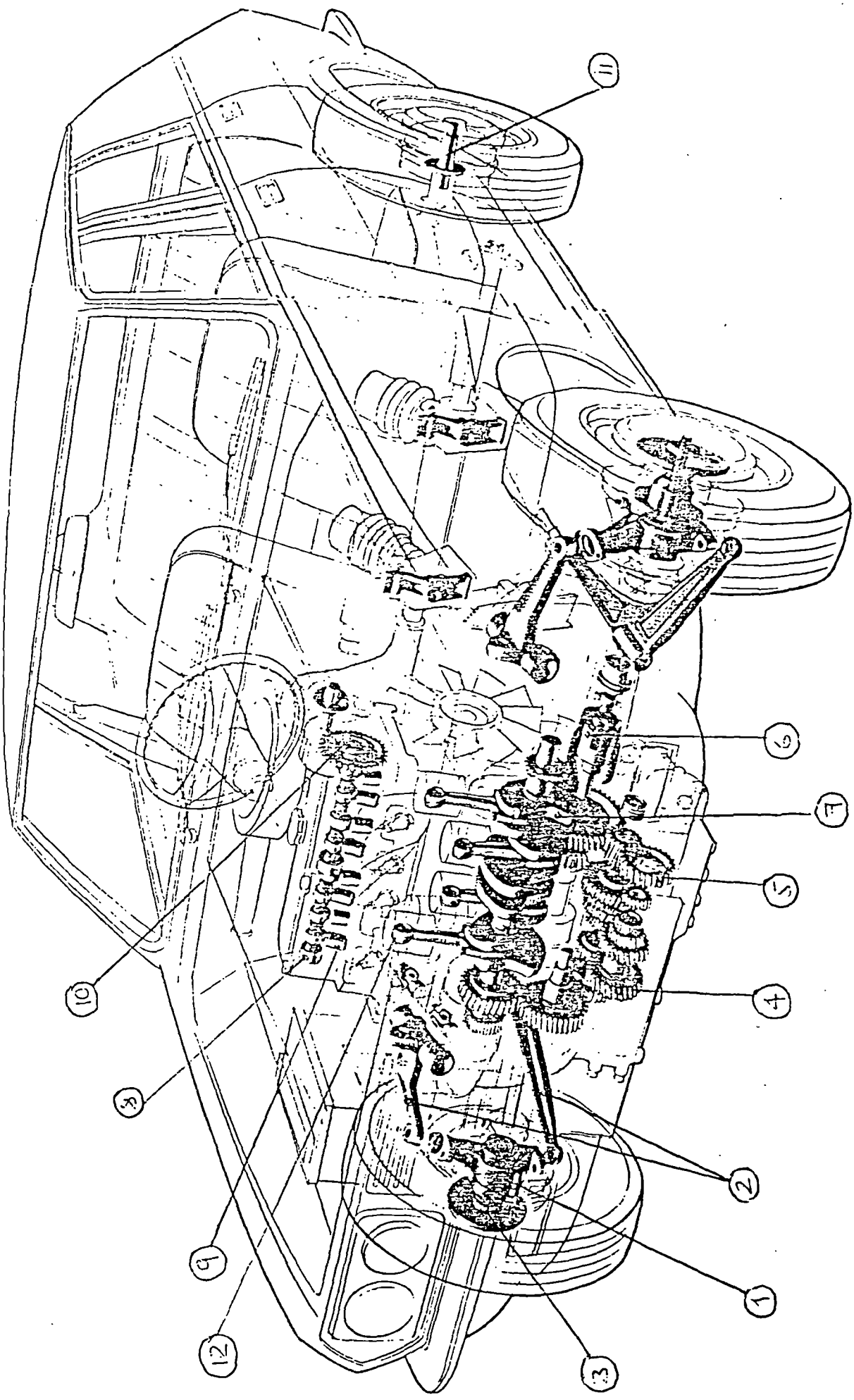
PASSENGER CARS :

1. Stub Axle
2. Suspension Arms
3. Wheel Hub
4. Gear Cluster
5. Gear
6. Constant Velocity Joint (see descriptions of joint types)
7. Crankshaft
8. Camshaft
9. Cam Followers
10. Camshaft Pinion
11. Axle Shaft
12. Connecting Rods (Conn-Rods)

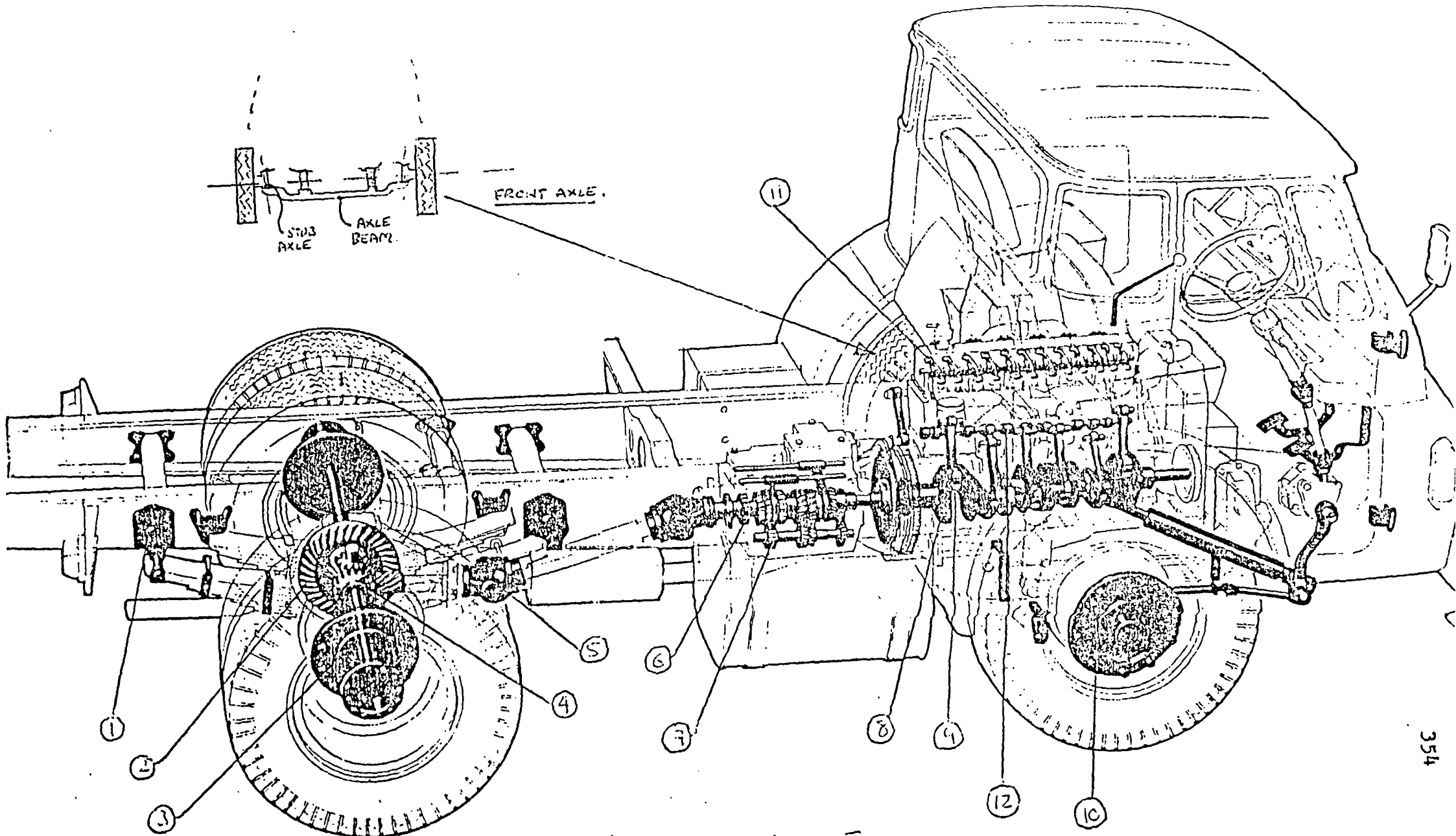
COMMERCIAL VEHICLES :

1. Chassis Brackets
2. Crown Wheel
3. Wheel Hub (Driving)
4. Differential Pinions
5. Universal Joints
6. Gear
7. Gear Cluster
8. Crankshaft
9. Connecting Rod
10. Front Hub
11. Valve Rockers

Axle Beam
Stub Axle } See Front Axle Diagram



PASSENGER CAR :-
DIAGRAM SHOWING COMPONENTS
MENTIONED IN THE REPORT



COMMERCIAL VEHICLE :-

DIAGRAM OF COMPONENTS MENTIONED IN THE REPORT.

Appendix C.2

Forging Manufacturers' Performances

Detailed analysis of sales and profit performances of forging companies over the last seven years is given in Tables C.21 and C.22 below. Companies are ordered by size, in terms of turnover, at the start of the period. The few companies identified as carrying out no automotive work are segregated. In order to gain an understanding of the competitive situation among UK manufacturers in such a fragmented industry, 36 automotive forging manufacturers with continuous figures are analysed in this section.

Table C.21 Market Performances

	Sales 76/77 £000	Sales 80/81 £000	Sales 82/83 £000	Growth 76/80 %p.a.	Growth 80/82 %p.a.	Growth 76/82 %p.a.
Price index	59.45	100.0	120.1			
Group I						
Burton-Deling'	11166	12389	11873	-8.5	-10.1	-7.9
Firth Derihon	10437	20661	15054	4.4	-19.7	-4.8
Bloxwich Lock	7048	11145	12699	-1.5	-2.6	-1.8
Birfield Extr'	6705	8853	8969	-5.4	-2.2	-5.6
S.Wales Forge'	5629	4217	3517	-13.9	-15.3	-11.5
Omes-Faulkners	5308	7391	4934	-4.3	-22.2	-9.0
Group II						
John Stokes	5230	5398	4704	-9.7	-13.7	-9.3
Head Wrightson	5065	5072	5212	-10.1	-7.2	-8.2
Stampings All'	4492	5396	3769	-7.1	-20.9	-9.7
Anslow	4475	6371	6099	-3.8	-10.1	-5.4
Dudley Drop	4071	7239	6842	1.4	-10.7	-2.8
Hughes-Johnson	3157	5846	5408	2.5	-11.5	-2.5
Group III						
George Morgan	2983	4543	3436	-2.4	-18.5	-7.2
Blackheath	2917	3241	1851	-8.5	-26.2	-11.4
Premier Stpgs	2800	6687	6943	10.5	-6.8	3.8
James Dickie	2791	4886	4056	1.0	-15.4	-4.7
Bescot Drop	2773	3071	2936	-8.5	-10.2	-7.9
Armstrong Stevens	2753	4983	*4376	1.9	*-13.4	*-3.6
Group IV						
Brockhouse	2741	4715	4438	0.1	-10.8	-3.3
Thos. Smith	2267	3618	3186	-1.3	-13.3	-5.1
T. Williams	2158	2826	2850	-5.5	-8.0	-5.8
Kimber Die	1772	2496	2295	-4.1	-11.7	-6.0
Halladays	1770	2135	2031	-7.1	-10.4	-7.2
Clydesdale	1647	3116	2226	3.1	-20.3	-5.5
Group V						
Light Metal	1618	3553	3315	7.6	-11.2	0.2
Arthur Edge	1496	1030	2805	-14.8	63.4	-1.2
Perkson	1252	2796	2925	8.2	-6.4	2.6
Brit' & Midland	1210	1864	1953	-2.1	-6.4	-3.4
Holden & Hayes	1175	2019	1818	0.1	-12.5	-3.9
J & S Eyres	1074	1788	1451	0.3	-16.2	-5.5
Group VI						
Criterion	900	1675	1280	2.7	-18.2	-4.9
Abbey Drop	798	850	812	-9.2	-10.2	-8.3
T.G. Lilleyman	730	858	1160	-7.5	-6.3	-3.6
Shaw-Dudley	539	797	891	-3.0	-3.5	-3.0
Scaffolding & Sup	*484	1285	1338	*14.5	-6.7	*6.1
W.H. Tildesley	453	899	988	-8.6	-4.2	1.3
Non automotive forgers:						
Cameron Iron	37956	73413	113338	3.7	14.3	8.0
George,Turton'	5023	7329	7374	-3.3	-8.1	-4.6

* This 76/77 sales figure has had to be based on that for 77/78.

Note: Growth rates have been calculated by first taking out inflation, based on the wholesale price index, and then calculating % growth p.a. on a simple arithmetic basis.

Table C.22 Profitability performances

	80/83 ROCE Rank	80/83 ROCE 3 yr	76/79 ROCE 4 yr	76/83 ROCE 7 yr	76/83 ROCE Rank	76/83 ROCE+ Growth	76/83 PERF Rank
Group I							
Burton-Deling'	23	-9.6	5.9	-0.8	26	-8.8	27
Firth Derihon	2	32.6	22.9	27.1	3	22.3	4
Bloxwich Lock	9	8.0	25.8	18.2	11	16.4	8
Birfield Extr'	7	9.2	9.6	9.4	18	3.8	20
S.Wales Forge'	27	-13.0	43.2	19.1	9	7.6	16
Omes Faulkner	31	-24.3	9.3	-5.1	29	-14.9	29
Group II							
John Stokes	16	-0.1	14.2	8.1	20	-1.2	23
Head Wrightson	19	-2.5	-11.7	-7.8	32	-16.0	32
Stampings All'	30	-22.7	6.5	-6.0	30	-15.7	31
Anslow	14	2.7	36.0	21.7	5	16.3	9
Dudley Drop	24	-10.0	16.7	5.3	23	2.5	22
Hughes-Johnson	1	55.7	35.3	44.1	1	41.6	1
Group III							
George Morgan	21	-8.1	13.7	4.4	24	-2.8	24
Blackheath	28	-13.5	1.6	-4.8	28	-16.2	33
Premier Stamp'	5	21.7	27.5	25.0	4	28.8	2
James Dickie	13	3.5	19.6	12.7	14	8.0	15
Bescot Drop	29	-15.9	0.7	-6.4	31	-14.3	28
Armstrong Stev'	22	-8.6	30.0	13.4	12	9.8	12
Group IV							
Brockhouse	32	-27.1	15.6	-2.7	27	-6.0	26
Thos. Smith	25	-10.2	8.8	0.7	25	-4.4	25
T. Williams	35	-62.8	23.0	-13.8	35	-19.6	34
Kimber Die	18	-1.8	22.3	12.0	15	6.0	18
Halladays	34	-30.8	8.8	-8.2	33	-15.4	30
Clydesdale	6	12.0	23.8	18.7	10	13.2	11
Group V							
Light Metal	3	27.0	17.1	21.4	6	21.2	5
Arthur Edge	26	-12.7	28.4	10.8	16	9.6	13
Perkson	12	3.8	9.4	7.0	22	9.6	14
Brit' & Midland	8	8.5	29.3	20.4	7	17.0	7
Holden & Hayes	15	1.1	33.7	19.8	8	15.9	10
J & S Eyres	20	-2.7	19.8	10.2	17	4.7	19
Group VI							
Criterion	4	25.3	37.1	32.1	2	27.2	3
Abbey Drop	33	-28.3	0.3	-12.0	34	-20.3	35
T.G. Lilleyman	17	-1.4	14.1	7.4	21	3.8	21
Shaw-Dudley	36	-98.6	24.1	-28.5	36	-31.5	36
Scaffolding ..	11	5.4	18.5	12.9	13	19.0	6
W.H. Tildesley	10	6.3	10.1	8.5	19	7.2	17

Appendix C.3

Performances Achieved by Competing Companies

Companies below are in descending order of size, based on sales turnover at the start of the seven year period in 1976/77. 1976/77 refers to figures submitted in the accounting period ending between April 1976 and April 1977, and data has been taken from ICC Business Ratio reports and has therefore been adjusted to achieve a greater degree of comparability.

Table C.31 Return on Capital Employed (Pre-tax)

Company	82/83	81/82	80/81	79/80	78/79	77/78	76/77
GKN Forgings	4.3	-0.2	-12.3	*-37.0	*8.3	*3.2	*19.8
Cameron Iron	33.5	39.5	32.1	20.8	17.0	19.7	*23.0
Dan' Doncaster?	-10.1	?9.1	?16.6	14.4	13.5	0.6	2.9
Burton-Deling'	-20.2	-6.2	-2.5	-0.6	1.0	3.5	19.7
Firth Derihon	10.3	32.2	55.3	26.3	25.0	20.4	20.0
Bloxwich Lock	5.1	9.0	9.9	19.3	24.2	30.7	29.2
Birfield Extr'	5.4	14.2	8.0	-3.8	21.4	7.2	13.6
S.Wales Forge'	-30.0	15.4	-24.3	45.2	26.9	46.6	54.1
Omes-Faulkners	*-65.8	-9.9	2.9	9.0	6.2	8.9	13.0
John Stokes	*-31.2	4.8	26.1	*6.2	7.4	16.3	27.1
Head Wrightson	-7.6	2.3	-2.1	-20.4	-26.9	-4.7	5.0
George,Turton'	-87.6	28.2	-15.7	-9.2	1.8	10.3	9.0
Stampings All'	-34.7	-28.3	-5.1	-5.5	13.4	10.4	7.8
Anslow	-2.1	8.5	1.6	21.5	23.4	26.6	72.7
Dudley Drop	*-4.2	-21.6	-4.1	8.2	19.6	20.9	18.2
Hughes-Johnson	*51.7	60.6	54.9	37.9	29.9	33.5	39.9
George Morgan	-2.4	-20.0	-1.9	6.6	17.8	17.1	13.4
Blackheath	-11.0	0.5	-29.9	*-2.4	-20.1	8.7	20.4
Premier Stamp'	*23.6	17.2	24.3	*28.6	29.5	29.8	22.1
James Dickie	4.9	1.4	4.1	10.8	16.6	22.2	28.7
Bescot Drop	*-21.1	7.9	-34.6	-4.5	-4.0	2.5	8.8
Armstrong...	?-8.6	-2.5	-14.8	23.8	55.4	17.2	23.6
Brockhouse	-29.5	-33.7	-18.1	5.1	23.4	19.4	14.5
Thos. Smith	-4.3	-23.8	-2.5	-0.4	10.5	12.8	12.3
T. Williams	*-156.7	-27.0	-4.6	*19.6	26.7	22.7	23.0
Kimber Die	8.2	-16.8	3.2	20.5	-0.6	30.1	39.3
Halladays	-35.5	-23.9	-33.0	*9.4	7.7	8.1	10.1
Clydesdale	4.9	11.7	19.3	25.7	28.9	20.9	19.6
Light Metal	13.0	38.0	30.0	12.7	11.5	20.3	24.1
Arthur Edge	14.4	-17.9	-34.6	*13.5	24.3	36.2	39.6
Perkson	0.0	-5.0	16.4	?11.2	5.9	2.5	17.9
Brit' & Midland	15.3	-7.1	17.4	17.5	32.4	38.7	28.8
Holden & Hayes	0.3	-0.5	3.6	26.3	36.3	45.6	26.8
J & S Eyres	-24.2	5.3	10.9	14.9	15.6	13.9	34.9
Criterion	28.0	14.7	33.3	43.1	50.1	43.0	12.3
Abbey Drop	-26.4	-27.4	-31.2	-17.8	5.5	8.6	5.0
T.G. Lilleyman	2.0	0.9	-7.1	15.4	20.2	2.3	18.4
Shaw-Dudley	?-167.0	?-167.0	38.2	51.9	27.8	14.2	*2.7
Scaffolding ...	-0.3	0.3	16.2	41.1	36.9	-14.8	?11.0
W.H. Tildesley	3.4	5.3	10.1	14.3	4.0	13.4	8.8

Note: As far as possible all figures have been taken directly from ICC Business Ratio reports to ensure consistency. Figures prefixed with * are gaps in ICC figures, filled using data from Companies House, taking care as far as possible to keep in line with ICC conventions. In a small number of cases, a continuous run of figures was destroyed by just one figure missing and figures inserted (prefixed with ?) represent the average of results for the two nearest years. Shaw-Dudley's capital employed went negative in 81/82, so figures for both 81/82 and 82/83 are given as averages over the two periods. Finally, figures for the most recent three years for Daniel Doncaster have been inserted using figures for the holding company INCO.

Table C.32 ROCE figures for companies without continuous figures for full 7 years

	82-83	81-82	80-81	79-80	78-79	77-78	76-77
Inco	-10.1	9.1	15.6				
River Don	-8.5	-22.1	-25.1				
HDA	7.2	13.5	15.4				
John Folkes	8.3	-3.7	9.9				
Woodhouse &..	21.3	19.5	29.0				
Ontario Corp	32.7	24.8	36.0				
Belgrave	-13.3	-6.5	-7.1				
Thornton	0.9	20.2	26.9				
Bretts	1.0	0.3	5.4				
Fred' Greenwood	21.9	16.7	-1.6				
Eva Bros	3.0	0.8	1.6				
Mills Bros	1.9	15.9	32.7				
Aerocoldform	15.6	11.8	11.3				
Epag	2.1	2.3	1.1				
Earlsdon Comp'	6.6	24.7	35.5				
Maurice Darby		3.1	3.9				
J. Reeside		-18.3	-14.7				
John Perks	21.9	43.8	96.9				
GKN Axles	0.7	5.2	-5.6				
Garringtons				6.1	-0.1	4.7	15.5
Kirkstall Forge				8.7	15.1	12.5	5.9
Smethwick Drop				6.5	7.0	19.8	23.8
GKN Shardlow				10.3	15.2	16.0	16.2
Scot' Stampings				-7.3	-14.9	-2.7	1.3
Smith Clayton				9.2	8.5	4.9	15.3
J. Shakespeare	Taken over				9.8	33.7	42.2
Norbrit-Pick'					-9.0	-4.3	11.9
A.J. Vaughan				14.3	23.6	22.2	5.9
Portway				11.6	10.8	15.3	18.1
Valor Partridge					-81.2	19.8	6.4
Vaughan Bros					-80.8	-22.9	-9.0
Platts				-92.5	-17.9	14.6	17.1
Smiths				-37.6	-17.7	23.8	28.8
George Dyke					1.6	3.1	35.2
Leslie & Co					20.4	23.0	3.0
Edmund-Vaughan					-42.3	9.5	-32.5
J. Stanley			-70.3	-149.9	-56.1	-61.2	32.4
S.A. Harris				18.6	26.6	22.4	44.0
Victoria Drop				18.6	23.0	17.0	
Francis Bros				33.9	27.1	9.5	25.0
Dan' Doncaster		5.2	7.8	6.7			
Scaffolding ...		5.4	21.1	14.4			

Appendix C.4

C.41 Forgings industry wage rate indices: (local currencies)

Table C.411 Average annual increases, %

	Germany	France	Sweden	Italy	UK
1972	11.00	10.50	4.60*	2.86*	10.5
1973	9.50	14.90	12.60	22.10*	10.92
1974	15.93	20.00	12.00	39.80*	18.60
1975	13.80	7.70	10.00	15.00	19.80
1976	8.50	15.00	9.90	9.00*	10.20
1977	6.20	13.00	4.90	22.00	9.80
1978	6.00	14.20	7.00	15.00	12.90
1979	4.30	12.00	8.00	19.00	15.40
1980	10.00	13.50	9.00	18.10	12.80

* estimates based on wholesale price index

Source: NADFS

Table C.412 Derived indices, 1980=100

	Germany	France	Sweden	Italy	UK
1971	44.50	32.29	47.46*	23.04*	32.29
1972	49.40	35.69	49.64	23.70*	35.68
1973	54.07	41.02	55.91	28.93*	39.59
1974	62.71	49.22	62.60	40.45*	46.95
1975	71.38	53.00	68.87	46.52*	56.22
1976	77.44	60.95	75.70	50.72	61.96
1977	82.24	68.86	79.40	61.87	68.03
1978	87.18	78.65	84.95	71.16	76.82
1979	90.92	88.08	91.74	84.67	88.63
1980	100.00	100.00	100.00	100.00	100.00

* estimates based on wholesale price index

Table C.413 Average sterling value

	DM	FF	Swe. Kr	lira
1971	8.515	13.466	12.471	1510.8
1972	7.987	12.635	11.920	1461.7
1973	6.540	10.899	10.674	1426.4
1974	6.049	11.246	10.374	1521.9
1975	5.4469	9.5003	9.910	1446.7
1976	4.552	8.6081	7.870	1497.2
1977	4.0504	8.5733	7.8332	1540.42
1978	3.850	8.6446	8.663	1627.79
1979	3.8875	9.0265	9.0919	1762.49
1980	4.2183	9.8217	9.8266	1992.36

Source: CSO Annual Abstract

C.42 Ratios of overseas forging wage rates to UK forging wage rates compared to 1980 ratios

Example of method:

	1971	1980
Wage rate indices for Germany (local currency)	44.50	100
Wage rate indices for UK (local currency)	32.29	100
Sterling value in DM	8.515	4.2183

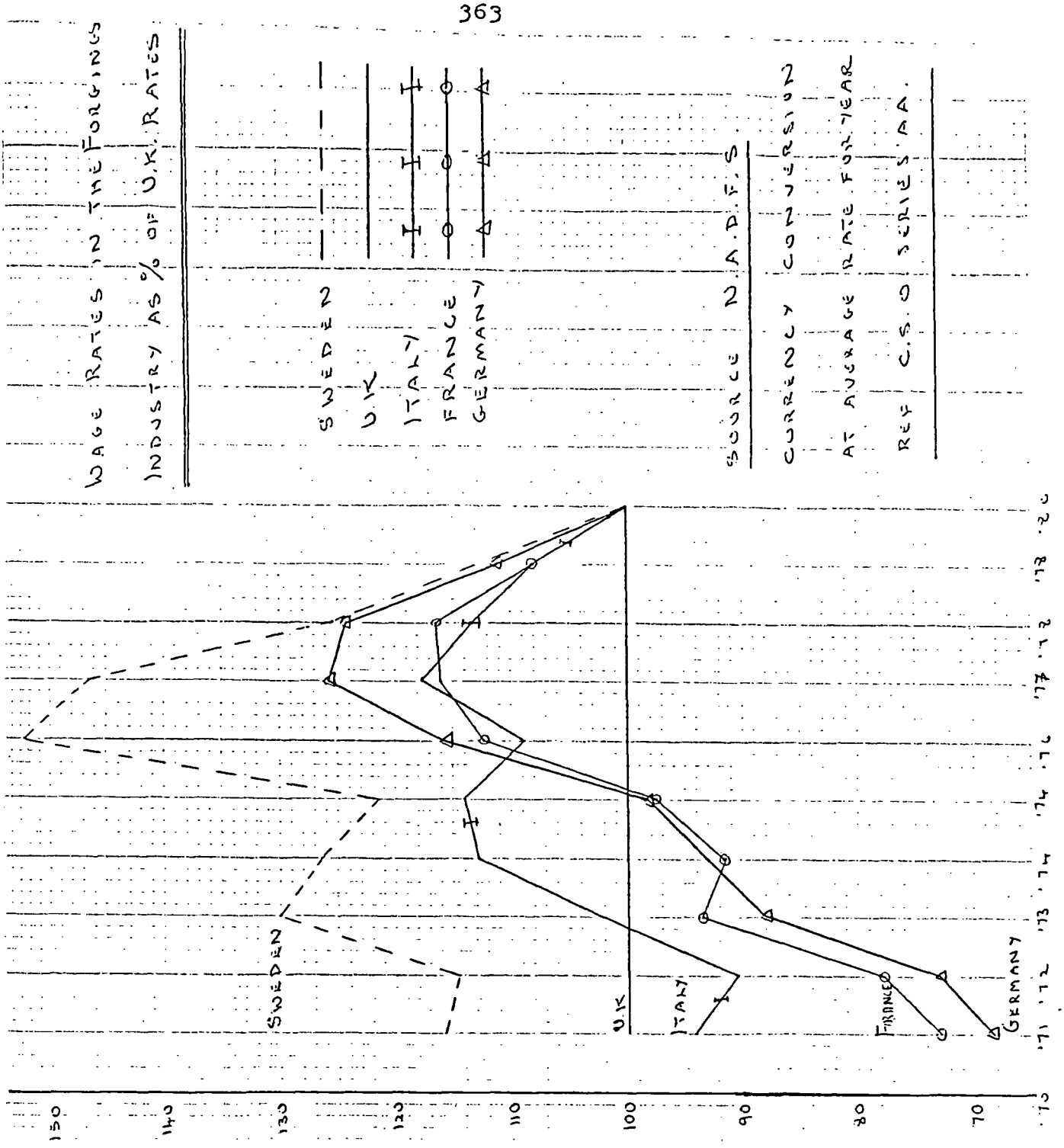
Rate of German wages/UK wages in 1971 as % of 1980 ratio $= \frac{4.2183}{8.515} \times \frac{44.50}{32.29} \times 100$

$= 68.2\%$

This implies that German wage rates were proportionately less competitive against UK rates in 1971 compared with the situation in 1980.

Table C.42

%	Germany	France	Sweden	Italy
1971	68.2	72.9	115.8	94.1
1972	73.0	77.8	114.7	90.5
1973	88.0	93.4	130.0	102.1
1974	93.0	91.6	126.3	112.8
1975	98.2	97.5	121.5	114.0
1976	115.7	112.2	152.6	108.9
1977	125.7	116.0	146.4	117.6
1978	124.2	116.3	125.4	113.4
1979	111.2	108.1	111.9	108.0
1980	100.0	100.0	100.0	100.0



Appendix C4
Forgings industry -
Wage rates overseas as %
of UK rates, compared
with situation in 1980

Appendix C.5

Further Details on Productivity Comparisons for Automotive Forging Companies

C.51 Differences in output mix

71% of <UKF1's> forgings are supplied for heavier applications such as commercial vehicles and tractors, with forging weights typically in the range 18-90kg. Lighter forgings for applications such as cars weigh from about 3-5.5kg, up to perhaps 9kg. <GF1> supplies a range of forgings both to car and commercial vehicle industries, focusing particularly on steering knuckles. These would generally be rather lighter than those produced by <UKF1>. <USF1> produces forgings for yokes, journal crosses, rings, pinions, and steering arms for both cars and trucks, these generally being rather lighter than forgings made by either <UKF1> or <GF1>. <JF1> produces forgings generally in the range 0.5 - 10kg, going up to 70kg, for applications such as truck links, crank shafts, knuckles, con rods, cam shafts etc. <JF2> produces generally in the range 2 -15kg, and up to 120kg for knuckles and heavier items such as front axles.

C.52 Differences in work done in-house

A check through process routes and production layouts suggested that all plants compared carried out similar operations, from billet shearing, to forging, heat treatment, inspection, die manufacture etc. However <JF1> contracted out a good deal of heat treatment work (heat treatment would typically represent about 5% of total manning for most forges) and certain machining work.

Appendix C.6

Strategies of Forging Manufacturers

This appendix examines the main strategies undertaken by companies whose performances were analysed in section 5.25. To assist the reader to gain an insight into those policies which have proved more successful, companies are discussed over seven years in order of performance. This is based on average ROCE plus average real sales growth. Sister companies, controlled by the same parent, are discussed together.

C.61 More successful companies

Hughes-Johnson and Light Metal Forgings

Hughes-Johnson and Light Metal Forgings, ranking respectively 1st and 5th on the combined index of performance, are both part of the J & H.B. Jackson group. Continuous performance figures are not available for Bretts, the other forging company in the group.

Success is mainly attributable to their aero activities, which represented 71% of sales in 1980 compared with only 10% for commercial vehicles and 3% for cars. Management must be given credit for positively increasing aero activities over some years. In 1974 aero represented about 50% of sales, commercial vehicles 10% and cars 6%. Size is not an important factor: Hughes-Johnson ranks 12th out of the 36 companies and Light Metal 25th, the two plants employing approximately 350 and 250 people respectively.

Premier Stampings

This fairly small company, employing about 130 people,

has been able to maintain consistent sales growth. Both growth and profitability have outstripped most other companies. Though on a gradual downward trend, profitability has been remarkably consistent over 10 years, margins being maintained between 11% and 21% and ROCE between 17% and 31%.

The strategy does not appear glamorous. For example, it does no exporting at all. Good performance seems to derive from attention to "basics", good financial control, and taking advantage of its small size to increase market share so as to offset market decline.

Such competitiveness has benefitted employees. Although employment has been slightly cut back in the last 2 years, employment over the last 10 years has increased. Average remuneration in 1982/83 was £9,300 - above the industry average.

Criterion and British & Midlands

Criterion and British and Midlands, ranking 3rd and 7th in performance, are both part of the Hill and Smith group, suggesting good management as the common factor. They have resisted any temptations offered by overseas markets (Criterion, for example, undertook no exporting in 1976). Despite unexceptional market performance, ROCE has been consistently in the top rankings for both companies.

Firth Derihon and River Don Stampings

Firth Derihon ranked second on ROCE performance in the last three years and third over the seven year period as a whole, but its sister company River Don Stampings has made

consistent losses, averaging -19% ROCE, over the last three years. The distinctive feature more recently has been the amalgamation and rationalisation of the forging activities of British Steel and Firth Brown.

Firth Derihon's good performance largely reflects their aero involvement, with 50% of sales accounted for by Rolls Royce.

Firth Derihon, entered the automotive forgings market some years ago as a deliberate counter-cyclical move, since the natural business cycle on the aero side is longer and therefore generally out of phase with that for the automotive market. Like other companies, their automotive side has been hit badly. Their main automotive strategy has been based on better technology and equipment, and this has resulted in greater volume orientation. Volume segments, however, have been hardest hit both by the domestic downturn and by international competition. The volume of business makes international trade worthwhile and international competitors are "scrambling" for any available volume business. An example is Ford wheel flanges. Two thirds of this business was for Germany, until Ford reduced its supplier network. Following a price increase this business was lost to an Italian supplier. Their volume-orientated presses have been hardest hit. From 20 presses originally in operation they are now only using 8.

River Don Stampings, the sister company, has been more heavily automotive orientated with about half of sales either to car or commercial vehicle customers. Efforts to reduce dependence on the car market have been frustrated by a declining UK industrial base generally. <>

The company has become more orientated to longer production runs and has increased the proportion of commercial vehicle business. <> This was achieved, but since 1979 UK commercial vehicle production has also halved so there has been little cushioning to decline on the car side. Another major market, tractors, was hit just as hard.

Using the group's expertise, they also succeeded in building up the aero side. <> As the aero market in turn plummetted, aero sales fell back in 1982 <>. They have achieved some offset through exports; but although their export ratio doubled <>, export volume did not rise at all, having been hit by the rise in sterling. Decline in automotive business has also been cushioned by the takeover and subsequent closure of Hadfield's Forge Lane plant. <> Otherwise losses would have been even higher.

<>

Light Metal: see Hughes-Johnson above.

Scaffolding & Supplies: insuffient information

British & Midlands: see Criterion above.

Bloxwich Lock & Stampings

Success owes little to forgings involvement. <> Their policy in automotive forgings was virtually to pull out.

Prices were under increasing pressure from vehicle manufacturer' more internationally orientated procurement operations, whilst UK forgers suffered from ageing plant and massive underutilisation. A typical forging shop would have no more than a quarter of hammers still in operation, intensifying rivalry. UK profitability was far too low.

They could not afford to pursue important technological opportunities. <> Pressure has intensified from substitute processes: eg car door hinges and lift gear on the BL1100 went over to fabrications. The best strategy in forgings was felt to be differentiation, through specialising on particular items, or particular shapes and sizes.

Since 1960 when automotive business generally represented 95% of sales, they have reduced this dependence <> through determined diversification into container gear, focusing on small items <>. The container business became even more international than the automotive business. No other UK manufacturer has succeeded to the same extent in this area; their success lay in recognising suppliers had to be equally internationally orientated, and in a high degree of focus so as to achieve a coherent international niche.

Anslow

A subsidiary of Duport, Anslow is heavily involved in automotive forgings, particularly steering arms, compressor cranks, suspension parts and sliding clutch gear parts. Although ROCE has fallen to an average of just under 3% in the last 3 years, performance is well above average. Their distinctive strategy has been to focus on close tolerance, highly stressed and safety critical forgings, and on small and medium order quantities in particular.

Holden & Hayes

This company's strategy was to specialise on steering parts and this made it difficult to reduce a heavy automotive dependence of about 70% including indirect sales to the automotive market. The focus on safety critical

parts fulfilled another element in their strategy, which was to increase value-added.

In some respects the company feels it may have been complacent when order books were full; they had not felt any need for exports to reduce dependence on a deteriorating UK market. They have though translated their strategy into real gains in terms of manufacturing efficiency: productivity doubled from 14.5 to 29 tons p.a./man between 1972 and 1979, rising a further 17% by 1981.

Despite a relatively good performance, their efforts were undermined in March 1980 when "sales died overnight". Average ROCE fell in the most recent 3 years to just over 1% compared with just under 34% during the previous 4 years. They have also slipped back relative to other companies, ranking only 15th out of 36 on ROCE during the last 3 years, compared with a ranking of 8th over the last 7 years as a whole. I would attribute this to their heavy automotive dependence, and to the volume orientation to some extent implicit in their strategy of specialisation.

Clydesdale

This company's relatively good performance can also be attributed to a focused competitive strategy. In the 1960's, the company undertook a conscious and boldly entrepreneurial plan, deliberately narrowing their customer base to focus on high quality forgings for automotive transmission parts, and in particular onto standard size ranges offering large order quantities. This overall strategy was followed through with considerable commitment. This involved buying literally the best equipment in the

world to suit the segment identified. Hammers for example were replaced with presses. During the 1960's, £4.5m was invested in basic plant and equipment, about £22,500 per employee. To this should be added a considerable investment in working capital, eg in a back up steel stock increased to 5,000 tons to enable faster delivery performance.

Most importantly, perhaps, considerable attention centred on translating the broader strategy in terms of manufacturing policies. Particular emphasis was placed on ideas coming forward from the shop floor, on schemes designed to foster employee loyalty - improving working conditions and long service awards. There has also been a persistent emphasis on improving products and productivity.

Armstrong Stevens

This company produces forgings for axle shafts and their facilities have been orientated to heavy stampings. They have pushed up exports from 1.6% of sales in 1973 to 9.2% in 1982. Growth performance has been quite good with turnover in 1982 3.3 times that in 1973, well ahead of inflation. Profitability in terms of ROCE has been reasonable over the last ten years in relative terms but unexciting, and losses were made in all of the latest three years for which figures were available. At the start of 1983 this company was taken over by the Benjamin Priest group, whose other forging companies are T.B. Wellings who make automotive forgings (eg for steering sockets) and A.J. Vaughan (Mitre) who make tools.

Fairly aggressive market penetration has not really paid off as well as it might have done in the economic

conditions prevailing: although the company ranked 12th on ROCE performance over the 7 year period, its position slumped to 22nd in the last 3 years. They have been hit particularly by the recent sharp decline in the UK commercial vehicle industry.

C.62 Companies displaying average levels of performance

Arthur Edge

This is a small forging company whose automotive involvement appears to be small. Its fairly good performance derives from its strategy of focusing onto scaffolding parts and therely achieving some measure of differentiation.

Perkson Forgings

The company supplies light forgings, up to about 3.5kg, direct to major automotive customers <> and products include items such as latches, handles, hinges, locking devices etc. The company has enjoyed a degree of cushioning against the downturn in the automotive forgings market since it uses forgings in its own products, eg in conveyors, another major field of activity. Its purchase of Golcher in April 1978, now its second site, was because it needed additional forgings capacity.

Even so, the company has experienced a severe downturn and both plants are now operating at half capacity. Like other forgers, recent strategies have been dominated by retrenchment and rationalisation. Employment since 1978 has been reduced by 40%.

Automotive business is under pressure from

international competition due to customers turning to international sourcing. They have just fought a battle with a Spanish supplier to retain one customer's <> steering forging parts, previously dual sourced with GKN; although they won prices were sliced back. For one customer <> on another item, clutch hub forgings, half of the business has been given to Spain, affecting both volume and profit margins.

The company do not feel there are any glamorous strategy alternatives in such a situation. They point to a number of areas outside their control which render Britain an uncompetitive place from which to manufacture automotive forgings. In this situation investment opportunities are rarely very attractive. It must be appreciated that with plants at half capacity, a reasonable ROCE of say 20% actually implies a target twice that level being demanded of the remaining plant actually in operation, and in the context of depressed margins. In consequence, the company's main strategy has been one of retrenchment aimed at restoring the balance between capacity and demand, together with sharpened attention given to fairly mundane manufacturing issues such as quality, productivity etc.

James Dickie

The sudden downturn in demand has created massive overcapacity. <>

Again there is nothing particularly glamorous about this company's strategy. They have deliberately steered clear of volume segments of the business, avoiding buying more modern, volume-orientated, presses. They have gone

instead for being a supplier of general forgings, relying on flexibility and low overheads to sustain their competitive position. Many hammers date back to Victorian days but are fully depreciated, and more flexible than modern equipment in the face of reduced order runs. <>

The company has avoided heavy investment strategies, has been prepared to surrender volume segments such as new gearbox business and areas in which other companies have specialised, such as aero. It has avoided exports altogether.

Productivity levels are low by international standards and have, despite some recent improvement, actually declined over the last decade because of increasing underutilisation. <>

They are now making a small loss on their forgings side, but are actually performing better than many forging companies. Flexibility has paid off and UK conditions have not been conducive to more progressive policies. One mistake they did make for example was in investing in the more modern spark erosion process in die manufacture. In the conditions now prevailing it is not even worth operating such volume orientated equipment, despite the fact that investment costs now have to be regarded as "sunk".

The company now concentrates its attention on incremental changes, such as cheaper methods of heating billets. They are critical of government support being focused on glamorous but less relevant areas such as robotics. Government support for the industry has been inconsistent over the decade. One moment they are given

enormous incentives to invest in modern equipment, which they do not really want, and the next moment the government is almost encouraging them to cut capacity.

They do not believe that more sweeping strategies, such as GKN Forgings' acquisition strategies, pay off in this type of industry, particularly in prevailing conditions.

Tildesley: insufficient information

Kimber Die: insufficient information

J & S Eyres: insufficient information

Birfield Extrusions: see GKN Forgings.

Daniel Doncaster (Now INCO Engineering Products Ltd)

One of Inco Engineering Products' plants still supplies the automotive industry, mainly on commercial vehicle forgings. <> The company identified a niche some years ago for the new (at the time) Lasco extrusion presses. They were one of the first companies in on this newer process and they have been able to sustain some competitive advantage, because of higher entry barriers due first to their head start and the experience effect, second to substantial capital costs, and third to the size of the appropriate market which limits the potential number of entrants.

The new technology was appropriate not only to automotive segments, but provided the basis for increased penetration into the other sectors. It is also interesting to note that they are now experiencing a highly international pattern of competition, the reasons being: first, greater capital requirements and technological opportunities have made it more worthwhile trading internationally and, secondly, all their customer industries

are themselves now highly international in their orientation. <>

Multinational customers, such as transmission manufacturers for example, have been increasingly prepared to move business around the world. It is possible to win further overseas business on the back of such customers, but it also increases international exposure both directly and indirectly. <>

The company has pursued more aggressive strategies than many forging companies. However, technological opportunities such as the Lasco extrusion press are volume orientated. The company estimates for example that it is not economical to switch from the traditional hammer process to presses on automotive applications until order runs are above about 2,000 units, and the same critical figure for the Laskos would be higher <>. Market conditions in Britain have slumped and order runs have been hit disproportionately, rendering such modern technological processes less economic. Even operating costs, such as die costs, heating costs and downtime costs, are higher on more modern processes when order runs are low; overhead costs including depreciation charges are anyway higher.

A volume production press department has had to be closed down completely, whilst traditional hammer shops have been maintained.

Consequently, like others, the company has had to take recourse to retrenchment and rationalisation. Employment has been cut substantially. Overheads have been cut particularly. <>

C.623 Worst performers

Thos. Smith

This company does only a small amount of work for automotive customers (eg Land Rover), having focused on products such as wrenches, spanners and slack adjusters. It employs 219 people, but its capacity of about 4,000 tons p.a. would imply productivity of no more than about 18 tons/man/year. Automotive forgers should assess alternative markets cautiously: the grass is not always greener.

Brockhouse

Described by their managing director as a "jobbing' forge (Modern Purchasing, October 1978), the company is said to aim at order runs of 250 to 2,500. This should have placed them in a better position to handle the sharp reduction in order runs.

However their other stated strategy of finding more specialised niches is probably more volume orientated: eg their 6" Lambert upsetter, installed in 1978, targeted on half-shaft forgings. Also the managing director's further comments suggested the company was not really committed to a more flexible manufacturing service: "...if we hold the dies and are asked for 100 forgings, we are duty bound to make them. But they have to pay through the nose for them. they have got to pay the value of a shift's work." I suspect that order runs in today's changed conditions have fallen to just such a level, and that the company is paying a price for not having pushed harder on flexible manufacturing systems.

Burton-Delingpole

Direct forgings for use in vehicles constitute too low a proportion of this company's sales to be of great significance in the context of automotive forgings. Again however the company's performance indicates that size is no easy guarantee of good performance.

Bescot Drop: see discussion on South Wales Forgemasters

Omes-Faulkners

Heavily dependent on the automotive industry, it would appear that the company has been caught in the competitive squeeze (discussed in section 5.2) between the larger group of companies able to utilise commercial muscle and greater technical sophistication on the one hand, and smaller companies characterised by lower overheads and greater flexibility on the other. It has tried unsuccessfully to move into the aero market, so as to increase value added. This company seems to be "caught in the middle" and needs to reposition itself decisively if it is to improve future performance: ROCE averaged minus 15% in the period 1976-83.

Halladays

This company is a mainstream automotive forgings company, supplying forgings such as crown wheels and gears directly to vehicle companies.

Their performance over a long period of time illustrates consistently falling performance even before the recent downturn. ROCE averaged 41% during 1963-66, 24% during 1967-71, 11% during 1972-76 and 7% during 1978-79. It has made significant losses in each of the last three

years.

One of the company's problems has been that, as a relatively small company, engaged in one of the high volume segments of the market, they have had difficulty in competing with larger companies who had presses for production of high volume components. <> Such problems could become more acute as car customers rationalise onto fewer sources of supply.

<>

The company has aggressively developed new markets, <> including exporting, but in the context of such a severe market downturn these policies do not appear to have paid off in terms of profitability or sustained growth. There have been heavy cuts in employment <>.

Stampings Alliance

Up to 1973, Stampings Alliance operated as an independent company, displaying reasonable performance. Margins averaged 4.5% between 1968 and 1973, and sales grew from £1.5m to £2.6m ahead of inflation, although 1973 was a peak year. In 1974, it was purchased by GM's Vauxhall to reduce supplier dependence and to ensure continuity of supply. The company was well equipped with modern plant. They had installed a modern 13m ton counterblow hammer in June 1972 and a fully automated Chambersburg Impact No 3 system in February 1973). On becoming Vauxhall's "in-house" supplier they pursued a strategy based on volume orientated production, installing modern CECO gravity drop hammers, from 2,000 to 6,000 lbs, and gearing up to volume production runs of automotive forgings.

Modernisation based on volume orientated equipment has proved crippling to this company. They have made losses in all of the last four years and may well be surviving only through GM support.

Head Wrightson

Over the last seven years this company has ranked 22 out of 24 both in terms of sales growth and ROCE. It has made losses in 5 out of the 6 most recent years. There seems to be little focus or synergy in the group. Their Hartlepool plant makes crown wheels and gears, whilst their Stockton Precision plant produces forgings for a wide range of products: pipe flanges, clutch hubs, camshaft gears, and tail shaft flanges. The parent company Davy Corporation does not seem to have had much success at improving this subsidiary's performance.

Blackheath Stampings

Blackheath is another example showing that being part of a powerful and, in this case, successful holding group (Armstrong Equipment) is no guarantee of performance in this sector. Decline dates back a long way though: return on net assets averaged 10.5% in 1963-66 and fell back into losses averaging 7.7% in 1967-69.

Blackheath employed about 230 people in 1980. Its strategy of specialising in forgings for safety critical steering arms and swivel pins does not seem to have afforded a protected niche. Its main production equipment comprises six hammers, which ought to be relatively flexible, but it is heavily dependent on automotive work.

T. Williams

This company, owned by the Eva group of industries, employs only about 70 people. It uses drop hammers and is focused on lighter forgings in the range 1 to 5 lbs, particularly conn rods and general items such as nozzle body holdings and hand tools such as spanners.

The company averaged 18% ROCE during 1963-70 which emphasises the extent of the decline in financial performance in more recent years.

It has been an aggressive exporter (the market for hand tools is more conducive to international trade as these forgings represent finished products and are lighter), with exports rising to 40% by 1981/82. This has have proved difficult to sustain. Exports fell back to 25% in 1982/83 and sales which had risen from £0.9m in 1972 to £3.4m in 1979/80 fell back even in nominal terms to £2.8m in 1982/83. Aggressive market policies have not paid off. They have made losses in all of the last three years, rising to -153% ROCE (40% of sales value) in the most recent year 1982/83.

Abbey Drop Forge: insufficient information

Shaw-Dudley: insufficient information

C.624 Other automotive forging companies

Dudley Drop Forge

This medium sized company, employing about 350 people, is heavily focused onto the automotive forgings segment and it is an important competitor in this sector. They are focused onto items such as conn rods, stubb axle forgings, engine parts and safety critical parts such as suspension

and steering items.

They made profits in every year between 1974 and 1979, averaging 25% ROCE, but have gone into loss in each of the three most recent years averaging -11%.

Their expressed strategy in 1978 was one of installing the most modern plant whilst "retaining versatility so essential in this type of consumer led industry". They have not been deterred by their fairly limited size, pointing out that although GKN controlled about 70% of forgings capacity, it was "questionable whether any great advantages accrue from sheer size" in this activity. Dudley Drop's exports are fairly modest at just over 10%. Their emphasis has been on material utilisation, productivity and quality control. This has meant increasing capacity. Capacity at their main plant increased from 5,450 to 8,200 tons p.a. between 1972 and 1978. In 1973, they had acquired and then totally reequipped Cartwright Bros (capacity about 1,500 tons p.a.).

They have been relatively successful, particularly in the past. Based on these capacity estimates, productivity would appear to be higher than in many other automotive forging companies: about 28 tons/man/year. However, recent conditions have not favoured capacity orientated strategies although they tried to retain flexibility, and this has depressed performance in the last three years. Like other forgers, they have recently undergone substantial retrenchment and cut-backs in employment (from 360 in 1979/80 to 251 in 1982/83).

TI Tubes

Most of this company's forgings are for commercial

vehicles <>.

<>

Earlsdon Components

Employment at this small family owned company halved between 1979 and 1982 from 106 to 57 people. Having responded quickly to the downturn, profitability has, however, improved. Up to 1977 the company made negligible profits, but it has moved back to reasonable levels.

Their main focus is engine valves, a highly international business, with forgings just part of the process. It is interesting that such a small manufacturer can be highly competitive against key multinational competitors such as TRW. They are technologically progressive: for example their small screw presses utilised robotic feeders, seen in few other UK forging companies.

The company's policies of a sharp focus, very low overheads, tight control over the use of all financial assets and good employee relations, have enabled costs to be kept down, even in the face of sharp market decline.

Folkes Hefo

There are perhaps few conglomerates such as this company, ranking in the Times Top 500, operating from such modest head quarters - an otherwise quite unremarkable semi in Stourbridge! Forgings is only one of their activities, but the success of this company (ranked fourth in a 1976 survey of West Midlands companies on ROCE) again seems to point to the importance of tight managerial control, low overheads, and close attention to basic, if unglamorous areas of efficiency.

C.625 Non-automotive forging companies

Cameron Iron (successful)

This US owned company enjoys a unique position in the fastest growing market segments: aero, power and petroleum applications. The processes involved are distinctive from other forging applications, and capital intensity is fairly high (eg £19,000/man in 1977). Competition here is now highly international and the company has been assisted by its US linkage and also by its Scottish location in respect to North Sea Oil business. It is the second largest UK forging manufacturer; but in its well chosen sector, it is fairly large even by international standards.

George, Turton Platts (unsuccessful)

This company produces no forgings for cars, a small amount for the larger commercial vehicles, and mainly specialises in aero applications. Given higher value to weight ratios and the international nature of the customer industry, the locus of competition has become highly international. George, Turton Platts is much smaller and less internationally based compared with Cameron Iron and Daniel Doncaster which is part of INCO, and it has been gradually "squeezed out". The aero sector had been relatively extremely buoyant, but recently plunged sharply, intensifying competition. The company averaged a very small profit during the earlier four year period, but the last four years has displayed continuous and mounting losses (up to -88% ROCE in 1982/83). Faster growing market segments are no panacea in the absence of a defensible competitive

strategy.

Appendix D.1

Volume indices for automotive component sales, 1973=100

Note: based on Business Monitor figures, adjusted for inflation using WPI figures in Table 49

	Carburettors	Coil springs	Laminated springs	Other parts and accessories	Oil filters
1963	160.4	156.7	64.3		
1968		313.7	62.5		
1973	100.0	100.0	100.0	100.0	100.0
1974	135.2	85.2	103.0	121.2	102.9
1975	137.9	77.6	103.5	115.5	84.3
1976	156.7	83.2	100.7	122.2	92.6
1977	158.2	95.2	86.1	115.1	94.1
1978	122.9	100.9	60.0	130.7	99.8
1979	134.9	132.8	95.0	108.9	96.2
1980	129.9	108.6	64.6	104.7	79.1
1981E	139.7	107.7	44.9	89.1	82.2
1982	138.9	103.0	43.2	72.7	67.6

	Brakes	Other engine parts	Mirrors	Radiators	Axles
1963	42.2			56.1	40.2
1968	56.5			72.8	70.6
1973	100.0	100.0	100.0	100.0	100.0
1974	95.1	93.4	74.4	100.5	87.4
1975	93.0	91.7	55.9	125.8	80.3
1976	102.8	92.6	78.3	101.5	85.1
1977	109.5	99.3	88.0	83.8	81.5
1978	108.6	100.2	87.2	90.7	88.5
1979	110.6	101.6	87.8	98.0	94.3
1980	95.1	73.5	62.8	78.3	76.1
1981E	74.2	68.0	66.8	65.5	64.7
1982	66.9	60.4	59.4	60.1	66.8

	Clutches	Shock absorbers	Steering gear	Wheels	Locks
1963	47.0	85.3	55.8	94.2	
1968	67.8	58.8	62.4	94.3	77.6
1973	100.0	100.0	100.0	100.0	100.0
1974	93.1	91.9	94.2	100.0	70.5
1975	94.9	90.0	97.0	77.6	57.3
1976	97.0	98.6	88.9	83.1	68.8
1977	95.7	105.5	86.8	105.1	56.1
1978	92.8	95.6	88.9	100.7	63.2
1979	92.8	99.5	90.5	92.1	83.7
1980	77.7	71.0	66.3	65.6	55.8
1981E	62.8	62.4	53.8	53.7	52.7
1982	53.9	60.5	47.0	50.3	

	Gearboxes	Chassis frames	Exhaust systems	Seats	Bumpers
1963		79.7		232.4	94.3
1968		113.5	54.8	260.7	78.3
1973	100.0	100.0	100.0	100.0	100.0
1974	88.7	93.2	101.8	83.7	89.8
1975	82.1	91.8	97.5	62.9	70.6
1976	83.0	92.8	97.7	66.1	80.5
1977	77.7	92.0	89.0	58.2	64.8
1978	78.6	93.3	108.3	43.1	56.2
1979	82.2	83.4	108.3	54.2	45.1
1980	57.9	63.1	59.3	29.3	26.0
1981E	51.0	44.7	43.7	18.2	12.3
1982	53.7	38.0	39.4	19.0	7.6

	Measuring instruments	Other electronic parts	Spark plugs	Fuel tanks	Body shells etc
1963				84.3	
1968				123.0	
1973	100.0	100.0	100.0	100.0	100.0
1974	95.5	163.9	83.4	69.5	65.6
1975	112.6	94.6	83.6	57.5	72.9
1976	115.6	119.8	95.2	54.1	86.2
1977	104.7	118.8	93.8	47.3	72.7
1978	112.8	146.1	96.3	51.8	67.4
1979	120.5	169.7	73.9	57.4	80.5
1980					
1981E					
1982					

	Starters and generators	Headlamps	Ignition equipment (exc coils)	Heaters	Horns	Engines total
1963				92.7		
1968				80.3		
1973	100.0	100.0	100.0	100.0	100.0	100.0
1974	95.2	89.7	59.4	95.6	67.6	68.8
1975	85.1	66.9	57.6	70.5	56.1	62.5
1976	91.0	70.0	72.1	70.3	49.2	81.2
1977	79.6	66.0	66.4	73.5	37.6	96.9
1978	91.8	73.6	70.0	71.2		90.6
1979	85.0	73.4	68.7	50.6	42.2	106.3
1980						90.6
1981E						90.6
1982						100.0

Appendix D.2

International trade in selected components

Exports/sales:

	Brakes	Axles	Shock absorbers	Wheels	Chassis frames	Spark plugs	Starters and generators	Mirrors
1973	2.5	2.7	10.8	24.3	7.6	44.7	-	3.7
1974	3.9	5.5	11.4	31.9	21.7	42.4	13.5	5.8
1975	6.4	5.7	11.0	38.1	21.7	31.7	21.8	6.1
1976	8.0	4.8	10.8	34.2	11.9	33.6	21.2	6.8
1977	9.3	5.4	9.1	37.7	10.0	40.0	20.4	5.3
1978	13.4	-	-	40.5	-	55.2	20.0	8.3
1979	8.3	-	-	41.4	-	46.8	19.8	13.9
1980	7.1	-	15.3	51.9	-	-	-	23.9
1981	Figures not available							
1982	4.5	5.9	12.6	40.9	-	-	-	15.9

Import penetration: Imports/(Sales-Exports+Imports)

	Brakes	Axles	Shock absorbers	Wheels	Chassis frames	Spark plugs	Starters and generators	Mirrors
1973	1.6	4.6	3.3	11.3	0.3	15.1	-	13.3
1974	1.7	4.9	4.0	13.9	0.6	22.5	7.0	17.7
1975	2.4	5.2	5.3	17.2	0.5	8.9	10.6	23.0
1976	3.8	4.1	5.0	15.7	0.2	14.8	8.1	22.6
1977	3.7	5.8	6.7	15.8	0.3	34.3	17.1	18.1
1978	5.8	-	-	17.3	-	44.4	14.6	26.2
1979	4.0	-	-	26.3	-	41.0	15.6	28.6
1980	3.4	-	-	37.4	-	-	-	27.5
1981	Figures not available							
1982	3.5	-	-	39.8	-	-	-	25.0

Source: SMMT Yearbooks

Appendix D.3

Sales Performance of Motor Component Manufacturers

Size Rank	Company	Sales Growth 1970-75 % p.a.	1975-79 % p.a.	1979-82 % p.a.	1975-82 % p.a.
1	Lucas	1.4	2.7	(6.2)	(1.4)
2	Chloride	12.5	1.5	(9.9)	(3.7)
3	Assoc Eng	0.8	1.0	(8.6)	(3.3)
4	Smiths	3.0	1.6	(1.0)	0.5
5	GKN Sankey		(5.3)	(19.3)	(9.5)
6	AP	(0.6)	3.9	(8.7)	(2.1)
7	BBA		0.7	(7.1)	(2.7)
8	Borg Warner		8.0	(12.1)	(2.3)
9	Quinton Hazell	5.9	6.7	(8.8)	(1.0)
10	J Woodhead	0.9	6.2	(14.2)	(4.1)
11	Eaton		(0.7)	(3.8)	(2.0)
12	Hardy Spicer	(1.0)	3.0	(8.0)*	(0.9)*
13	Cam Gears	0.7	2.6	(12.2)	(4.3)
14	Armstrong	(0.5)	19.1	(5.3)	6.9
15	Triplex		2.4	(11.5)	(4.0)
16	Leys Foundries		3.1	(19.2)	(8.2)
17	BRD		(1.2)	(5.1)	(2.8)
18	TI A&P		(5.9)	(12.2)	(7.4)
19	Turner		(1.0)	(3.1)*	(1.7)*
20	TRW Valves		(6.1)	(13.6)	(7.9)
21	Champion	1.1	7.3	(13.0)	(3.0)
22	Camford		11.2	(8.6)	1.1
23	Burman	(0.4)	1.3	(16.2)	(6.6)
24	Rockwell Maudsley		(3.5)	(12.8)	(6.7)
25	Rockwell Thompson		(1.9)	(10.7)	(5.3)
26	Trico Folberth	(4.0)	(0.4)	(10.7)	(4.8)
27	Oldham		14.7	(10.1)	1.5
28	Fram Europe		(3.0)	(2.4)	(2.6)
29	Britax Wingard	8.9	15.8	(15.8)	(2.0)
30	TRW Clifford		(1.5)	(10.3)*	(4.2)*
31	TI Cheswick		11.4	(15.4)	(3.1)
32	Hobourn Eaton	2.8	5.5	(17.3)	(5.9)
33	Concentric Pumps	2.6	1.6	(6.2)*	(1.0)*
34	Motor Panels		14.8	(15.3)	(2.0)
35	Kangol Magnet		1.2	(8.4)	(3.7)
36	Silent Channel	0.0	(1.3)	(12.2)	(5.7)
37	Intec		4.0	(26.4)	(10.8)
38	Airflow	(3.7)	38.9	(8.6)	12.8
39	Adwest		0.2	(12.4)	(5.2)
40	CH Industrials		34.8	(8.9)	10.7
41	TI Cox		3.4	(6.6)	(1.3)
42	Supra		12.4	(7.1)	2.4
43	Bluemel	1.5	(1.4)	(14.2)	(6.5)
44	Burgess		7.0	(15.9)	(4.2)
45	Abbey Panels	(4.9)	7.6	(5.8)	1.1
46	GKN Kent Alloys		19.8	(10.1)	3.6
47	Hallam Sleigh		3.3	(16.2)*	(3.9)*
48	IHW		4.0	(9.4)	(2.4)
49	Concentric Prod.		2.2	(17.3)	(6.8)
50	Wipac	(6.1)	9.0	(7.7)	0.7

Sales Performance of Motor Component Manufacturers (contd)

Size Rank	Company	Sales Growth 1970-75 % p.a.	1975-79 % p.a.	1979-82 % p.a.	1975-82 % p.a.
51	Britax Dynasafe		(15.3)	(21.2)	(12.3)
52	Brockhouse	(0.9)	8.3	(21.7)	(7.6)
53	TI Nicholson		4.3	(4.8)	0.1
54	CBS Auto & Ind		12.0	(8.7)	1.3
55	Chillcotts	(0.9)	8.1	(12.4)	(2.4)
56	Desmo		1.2	(18.6)	(7.7)
57	HK Porter		0.2	(7.8)	(3.3)
58	Tenneco Walker		14.8	3.0	10.5
59	Commercial Ignit.		1.7	(9.6)	(3.4)
60	Joseph Fray		6.5	(17.8)	(5.9)
61	Raydot		17.5	(10.9)	2.0
62	Flexible Lamps		16.1	(6.0)	5.0
63	Hills (Patents)		6.5	(9.2)	(1.3)
64	Intermotor		16.6	(1.1)	8.7
65	Eversure		(3.2)	(33.1)*	(11.8)*
66	Motaproducts		(691.1)	2.8	(428.7)

Note: Figures based on sales growth adjusted for inflation using WPI. Annual rates shown on a simple rather than compounded basis.

* period to 1981 only

Appendix D.4

ROCE Performance of Motor Component Manufacturers

Size Rank	Company	Average ROCE 1970-74 %	1975-79 %	1980-82 %	1975-82 %
1	Lucas	10.1	15.1	2.1	10.2
2	Chloride	21.0	15.1	(3.1)	8.3
3	Assoc Eng	10.7	17.2	1.4	11.3
4	Smiths	15.4	17.1	17.1	17.1
5	GKN Sankey		15.1	(25.2)	0.2
6	AP	15.8	13.7	(4.9)	6.7
7	BBA		15.9	4.7	21.8
8	Borg Warner	(1.5)	2.2	7.1	4.0
9	Quinton Hazell	12.3	15.9	(0.4)	9.7
10	J Woodhead	18.0	18.1	(12.8)	6.5
11	Eaton		5.5	(19.7)	(4.0)
12	Hardy Spicer	13.9	12.0	5.5	10.2
13	Cam Gears	10.9	47.2	1.9	30.2
14	Armstrong	22.6	19.5	3.2	13.4
15	Triplex		5.4	(14.7)	(2.1)
16	Leys Foundries		9.3	(12.3)	1.2
17	BRD		43.0	(13.3)	21.9
18	TI A&P		0.5	(9.5)	(3.3)
19	Turner		21.0	3.2	15.9
20	TRW Valves		5.1	(15.9)	(2.8)
21	Champion	58.8	50.1	5.8	37.4
22	Camford		12.6	(4.3)	6.3
23	Burman	14.0	16.0	5.6	11.6
24	Rockwell Maudsley		16.5	21.1	18.2
25	Rockwell Thompson		19.9	2.3	13.3
26	Trico Folberth	22.9	16.6	2.4	11.3
27	Oldham		48.1	16.3	36.1
28	Fram Europe	18.5	5.3	(15.7)	(2.6)
29	Britax Wingard	31.1	68.1	6.3	44.9
30	TRW Clifford		20.7	15.2	19.1
31	TI Cheswick		47.7	11.1	34.0
32	Hobourn Eaton	18.7	23.4	(28.2)	4.1
33	Concentric Pumps	12.6	29.9	23.7	28.2
34	Motor Panels		2.5	(21.9)	(6.7)
35	Kangol Magnet		13.4	(0.3)	8.3
36	Silent Channel	12.1	1.9	(25.6)	(8.4)
37	Intec		16.0	(3.7)	8.6
38	Airflow	31.6	22.9	1.8	15.0
39	Adwest		24.0	6.5	17.4
40	CH Industrials	21.6	11.2	5.7	9.1
41	TI Cox		8.4	13.4	10.3
42	Supra		15.6	7.8	12.7
43	Bluemel	20.4	15.2	7.8	12.7
44	Burgess		16.2	4.8	11.9
45	Abbey Panels	19.4	14.9	10.3	12.5
46	GKN Kent Alloys		12.4	6.1	10.1
47	Hallam Sleigh		6.5	(15.5)	21.4
48	IHW		86.6	35.4	67.4
49	Concentric Prod.		12.7	(22.0)	(0.3)
50	Wipac	17.2	11.7	(3.2)	6.1

ROCE Performance of Motor Component Manufacturers (contd)

Size Rank	Company	Average ROCE 1970-74 %	1975-79 %	1980-82 %	1975-82 %
51	Britax Dynasafe		(32.3)	(27.2)	(30.4)
52	Brockhouse	(23.5)	7.8	(50.6)	(14.1)
53	TI Nicholson		55.8	26.3	44.8
54	CBS Auto & Ind		30.5	(28.6)	8.3
55	Chillcotts	7.4	21.8	16.2	19.7
56	Desmo		0.9	(6.0)	(1.7)
57	HK Porter		26.6	(2.3)	15.8
58	Tenneco Walker		(50.2)	2.2	(34.9)
59	Commercial Ignit.		29.0	10.0	21.9
60	Joseph Fray		36.3	5.5	23.8
61	Raydot		19.5	(13.6)	7.1
62	Flexible Lamps		37.9	22.5	32.2
63	Hills (Patents)		37.3	(10.1)	19.5
64	Intermotor		25.3	5.5	17.9
65	Eversure		9.7	(86.5)	(17.8)
66	Motaproducts		45.0	0.7	28.4

Appendix D.5

Trends in earnings/hour in manufacturing

Table D.51
Earnings trends in manufacturing: national currencies

	UK p/hr M	Germany DM/hr MF	Japan* 000Y/mth MF	USA $/hr MF	France FF/hr MF	Italy lira/hr MF	Sweden kr/hr MF
1960	32.0	2.62	22.6	2.26	2.09	232	5.77
1961	34.0	2.90	24.8	2.32	2.25	248	6.23
1962	35.4	3.23	27.3	2.39	2.44	286	6.17
1963	37.0	3.46	30.2	2.46	2.65	334	6.69**
1963							7.29
1964	39.8	3.74	33.1	2.53	2.84	371	7.94
1965	43.7	4.12	36.1	2.61	3.00	386	8.78
1966	46.2	4.42	40.5	2.72	3.18	401	9.60
1967	48.3	4.60	45.6	2.83	3.37	425	9.30
1968	51.6	4.79	52.7	3.01	3.79	445	9.87**
1968							11.17
1969	55.9	5.28	61.8	3.19	4.21	489	12.15
1970	64.4	5.96	71.4	3.36	4.66	606	13.52
1971	72.0	6.66	81.0	3.56	5.18	708	14.91
1972	82.1	7.24	93.6	3.81	5.82	788	16.76
1973	92.9	8.03	116.3	4.07	7.05	966	16.05
1974	111.6	8.94	146.5	4.42	8.39	1209	17.81**
1974							20.30
1975	139.9	9.69	163.7	4.83	9.82	1794	23.79
1976	155.9	10.35	183.6	5.22	11.11	2133	24.09
1977	168.7	11.14	200.8	5.68	12.58	2673	25.70
1978	194.9	11.73	214.6	6.69	14.20	3244	27.94
1979	227.5	12.36	227.8	6.69	16.04	3874	30.11
1980	266.4	13.18	244.6	7.27	18.46	4684	32.67
1981	293.4	13.92	259.7	7.99	20.72	5742	36.24
1982	319.7	14.64	269.3	8.50	23.97	na	39.08

M = men
MF= men and women

* The purpose of these figures is to establish trends over time. National differences in methods of recording labour rates make absolute comparisons at any particular point in time dangerous. However Japanese monthly rates can approximately be converted to an hourly basis by dividing by 167.8, the estimated number of hours worked per month for 1979. This has been done in D.54 below.
** Series breaks at this point and new series starts.

Source: UN Monthly Bulletin of Statistics / ILO

Table D.52

Sterling exchange rates:

	Germany DM	Japan yen	USA $	France FF	Italy lira	Sweden kr
1960	11.699	1004.6	2.8007	13.753	1740.1	14.535
1961	11.222	1016.0	2.8023	13.758	1742.2	14.560
1962	11.203	1003.9	2.8078	13.736	1739.4	14.535
1963	11.116	1013.0	2.8003	13.710	1740.6	14.535
1964	11.096	999.7	2.7925	13.671	1743.2	14.355
1965	11.165	1011.4	2.7962	13.702	1746.7	14.424
1966	11.168	1011.4	2.7932	13.723	1744.0	14.428
1967	11.122	871.1	2.7901	13.730	1741.0	14.399
1968	9.555	852.9	2.3937	11.855	1491.9	12.363
1969	9.3941	858.9	2.3903	13.3445	1499.1	12.356
1970	8.736	857.84	2.3960	13.244	1502.4	12.423
1971	8.515	843.57	2.4456	13.466	1510.8	12.471
1972	7.987	753.65	2.5054	12.635	1461.7	11.920
1973	6.540	664.56	2.4526	10.899	1426.4	10.674
1974	6.049	682.66	2.3402	11.246	1521.9	10.374
1975	5.4469	658.08	2.220	9.5003	1446.7	9.910
1976	4.552	535.43	1.8049	8.6081	1497.2	7.870
1977	4.0504	467.65	1.7455	8.5733	1540.42	7.8332
1978	3.850	402.73	1.9197	8.6446	1627.79	8.663
1979	3.8875	465.55	2.1225	9.0265	1762.49	9.0919
1980	4.2183	526.39	2.324	9.8217	1992.36	9.8266
1981	4.556	444.63	2.0254	10.9356	2287	10.192
1982	4.243	435.20	1.7489	11.4846	2364	10.963

Source: CSO Annual Abstract

Table D.53

Earnings trends in manufacturing: pence/hour unless specified:

	Germany	Japan	USA	France	Italy	Sweden
		£/month*				
1960	22.4	13.4	80.5	15.2	13.3	39.7
1961	25.8	14.5	82.8	16.4	14.2	42.8
1962	28.8	16.2	85.1	17.8	16.4	42.4
1963	31.1	17.8	87.8	19.3	19.2	50.2
1964	33.7	19.7	90.6	20.8	21.3	55.3
1965	36.9	21.3	93.3	21.9	22.1	60.9
1966	39.6	23.9	97.4	23.2	23.0	66.5
1967	41.4	31.2	101.4	24.5	24.4	64.6
1968	50.1	36.8	125.7	32.0	29.8	90.3
1969	56.2	42.9	133.5	31.5	36.6	98.3
1970	68.2	83.2	140.2	35.2	40.3	108.8
1971	78.2	96.0	145.6	38.5	46.9	119.6
1972	90.6	124.2	152.1	46.1	53.9	140.6
1973	122.8	175.0	165.9	37.3	67.7	150.4
1974	147.8	214.6	188.9	64.6	79.4	195.7
1975	177.9	248.8	217.6	103.4	124.0	258.8
1976	227.4	342.9	289.2	129.1	142.5	306.1
1977	275.0	429.4	325.4	146.7	173.5	328.1
1978	304.7	532.9	348.5	164.3	199.3	322.5
1979	317.9	489.3	315.2	177.7	219.8	331.2
1980	312.4	464.7	312.8	188.0	235.1	332.5
1981	305.5	584.1	394.5	189.5	251.1	355.6
1982	345.0	618.8	486.0	208.7	na	356.5

*See note to D.51 above

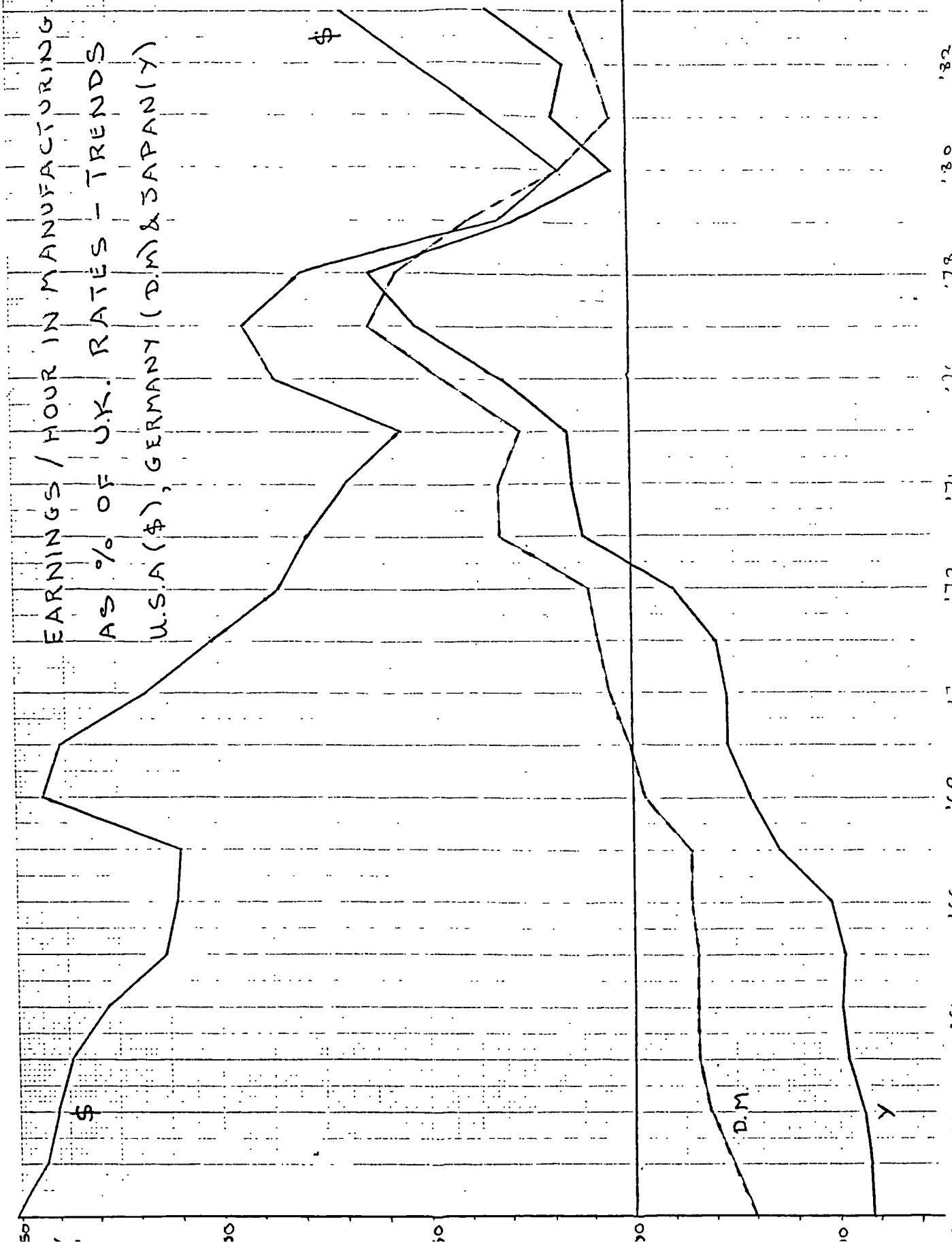
Table D.54

Trends in overseas manufacturing earnings per hour as % of UK rates

	Germany	Japan	USA	France	Italy	Sweden
1960	70.0	41.9	251.6	47.5	41.4	124.0
1961	75.9	42.6	243.5	48.2	41.8	125.9
1962	81.3	45.8	240.4	50.3	46.3	119.8
1963	84.1	48.1	237.3	52.2	51.9	135.7
1964	84.7	49.5	227.6	52.3	53.5	138.9
1965	84.4	48.7	213.5	50.1	50.6	139.4
1966	85.7	51.7	210.8	50.2	49.8	143.9
1967	85.7	64.6	209.9	50.7	50.5	133.7
1968	97.1	71.3	243.6	62.0	57.8	175.0
1969	100.5	76.7	238.8	56.4	65.5	175.8
1970	105.9	77.0	217.7	54.6	62.6	168.9
1971	108.6	79.4	202.2	53.4	65.1	166.1
1972	110.4	90.1	185.2	56.1	65.7	171.3
1973	132.2	112.3	178.6	40.2	72.9	161.9
1974	132.4	114.6	169.3	57.9	71.1	175.4
1975	127.2	105.9	155.5	73.9	88.6	185.0
1976	145.9	131.2	185.5	82.8	91.4	196.3
1977	163.0	151.7	192.9	87.0	102.8	194.5
1978	156.3	162.8	178.8	84.3	102.3	165.5
1979	139.7	128.2	138.5	78.1	96.6	145.6
1980	117.3	103.9	117.4	70.6	88.3	124.8
1981	104.1	118.6	134.5	64.6	85.6	121.2
1982	107.9	115.3	152.0	65.3	na	111.5

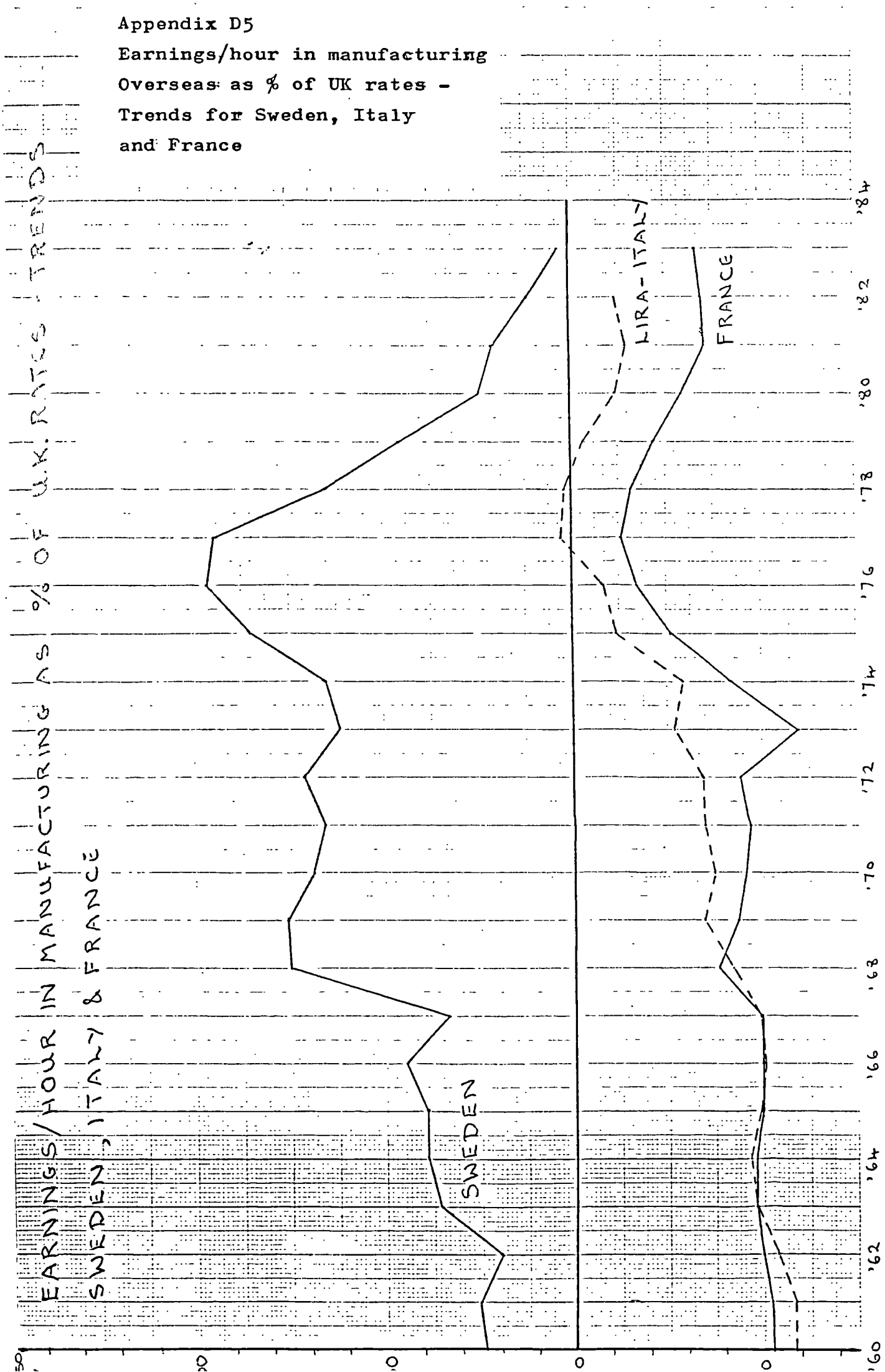
Appendix D5

Earnings/hour in manufacturing Overseas as % of UK rates - Trends for USA, Germany and Japan



Appendix D5

Earnings/hour in manufacturing Overseas as % of UK rates - Trends for Sweden, Italy and France



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